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AUTHOR Ng, Gan Che, Ed.; And Others
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ABSTRACT

Eight papers presented at the Third International Conference of the Australasian Association of Institutional Research (AAIR) are published in this journal issue. They represent the diversity and richness of the field of Planning in the Public Sector" (Jack Smith); (2) "Futures Planning for Tertiary Education: Curricula for the 21st Century: The Student and the Problem" (Graham J. Logan); (3) "An Infra-Structure for the Provision of Campus Information Services" (J. Dockerill); (4) "Educational Pathways in a Multi-Sectoral Institution: Challenges and Strategies for the Future" (Gan Che Ng and others); (5) "Quality of Student Outcomes: Concepts and Issues of Measurement" (Gan Che Ng and others); (6) "Integrating Total Quality Management into Review of Educational Institutions" (K. K. Navaratnam and Rory O'Connor); (7) "RPL Building Equity into the Assessment Model" (Mary Jones and others); (8) "A Potpourri of Institutional Research Issues in a Planning Environment" (Jim Tognolini and Robert McCormack). (SLD)

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Editors: Ng Gan Che, Meg Probyn, Raj Sharma

Subscription or Membership Enquiries to :
Dennis Ham, University Statistician, Curtin University of Technology
Kent Street Bentley Perth 610 WEST AUSTRALIA
Phone 09 351 2240; Fax 09 351 2084

PREFACE

We would first of all like to apologise for the delay in the production of this issue due to a change in Editorial Committee Members. This preface attempts to provide a list of the content of articles published in this issue. However, please note that the order of the articles printed is different from the order that they are mentioned in this preface. This is because articles have already been typed on the computer when the new Editorial Committee took over, and it would take too much time to revise the sequence.

Eight of the nine papers in this issue have been presented at the Third International Conference of the AAIR in Auckland, New Zealand, 25-27 November 1992. The papers selected represent the diversity and richness of the expanding field of Institutional Research (IR) which, unfortunately, has not taken off as rapidly as it should be in Australia given the new challenges set by the Dawkins reform agenda for tertiary education institutions. Some of the reasons for this relatively slow development of IR in Australia have been alluded to in the two papers by Smith, Tognolini and McCormack. Smith's paper, "Applying Institutional Research and Planning in the Public Section" argues that IR concepts and techniques are just as useful in the study of public sector organisations in aspects such as administration, financial management and decision support. Tognolini and McCormack's paper, "A Potpourri of Institutional Research Issues in a Planning Environment" discusses the need for institutional researchers to create an identity for themselves and to make an impact within the organisational hierarchy. Both papers emphasise the significant role of IR in institutional planning and management at both the micro and macro-levels.

For IR to be effective in a decision support system, an efficient infrastructure for servicing campus information network has to be established. In a paper titled "An Infrastructure For The Provision of Campus Information Services", Dockerill discusses how such a network can be implemented in a case study of City Polytechnic of Hong Kong. Such networks should not be restricted to within an institution alone, as Mulroney's paper on "Linking education, industry and the community: a regional model" illustrates the various activities that can serve the purpose of developing a wider support network. There is no doubt that establishing information networks at the local, regional, national and international levels is critical to IR objectives such as environmental scanning and futures planning, as reflected in Logan's paper titled "Futures Planning for Tertiary Education Curricula for the 21st century: the student and the problems". Logan observes that the challenge for administrators and planners will be to balance the costs and gains while catering for the quality needs of students and staff.

Four other papers identify and address the quality needs of students and staff. Ng, Sharma and Heskin's paper, "Quality of student outcomes: concepts and issues of measurement", attempts to ascertain from the various stakeholders their perception of what generic skills students should achieve from their university studies. Meanwhile, Jones, Sharma and Thompson's paper "RPL: Building Equity into the Assessment Model" argues for the recognition of prior learning in student entry and suggest ways of measuring RPL.

Navaratnam and O'Connor's paper, "Integrating total quality management into review of educational institutions" emphasises that such a process is necessary if institutions are to obtain a strategic advantage in making continuous improvement in the provision of quality learning. Finally, Ng, Pantazis and Sharma's paper "Education Pathways in a Multi-Sectoral

institutions: challenges and strategies for the future" examines various ways - in particular, the multi-entry and multi-exit model - of providing students with pathways in tertiary education.

As stated in the Guidelines for Submissions, the Editorial Committee encourage comments from readers concerning the articles published. The next issue, Volume 3 Number 1 will be published in April 1994, focusing on the theme: Quality in Tertiary Education. We already have enough papers for this issue. However, we are now inviting contribution of articles for Volume 3 Number 2 which is scheduled for August 1994.

The AAIR Executive and the Editorial Committee would like to pay a special tribute to the late Con Pantazis, former Associate Director of Prahran College of TAFE, who passed away recently. Con had been a strong supporter of AAIR's activities since its inception.

We wish readers and members a Merry Christmas and a Happy New Year.

Editorial Committee: Ng Gan Che, Meg Probyn, Raj Sharma

APPLYING INSTITUTIONAL RESEARCH AND PLANNING IN THE PUBLIC SECTOR

Dr Jack Smith
Faculty of Health Sciences
La Trobe UCNV Bendigo

Introduction

The introduction of Institutional Research and Planning in Australia during the early 1980s coincided with a time at which many organisations were dispensing with specialist research groups. As the conventional wisdom of the time had it, separate research groups have a tendency to serve their own interests rather than those of the institution. Amongst other factors this is why IR has not become so well established in Australia. Despite the unfortunate timing of its introduction, the concepts and methodologies of IR have an important role to play not only in higher education but also in the public service and probably in the business community as well. When not constrained by tightly prescribed roles, the creativity and skills of institutional researchers can be invaluable in a wide variety of settings.

The present article had its origins in a doctoral major in IR. Over the next nine years it was applied in the public service. It was put to use in three different departments; Education, The Office Of The Public Service Commissioner, and Health and Community Services. In none of them was there an office of IR nor even an organisational research unit. Yet, the work carried out in each applied and extended the grounding that had been acquired during an IR training. The experience confirmed the belief that an IR training, used creatively, can be effective in different environments. In this sense IR can be regarded as an appropriate form of senior management training. In the present case IR was applied in three human services departments in a state public service. In each case decison-making processes and management issues were remarkably similar, suggesting that specialisms built up around specific areas of service delivery can be questioned for their validity.

In summarising and evaluating the attempt to set IR to work over such a long period, a short account should be given in the first instance of what is understood by IR. A brief description of the way in which it was used in each department follows. From the analysis it is possible to extract some issues and discuss their implications for the future.

The Scope of IR in Higher Education and the Public Service

Higher education institutions like to regard themselves as being unique but are as much a part of the public sector as government departments, agencies and instrumentalities. The post World War II changes which swept through higher education also had profound effect on all parts of the public sector. The

management science and operations research movements which strongly influenced the early years of IR had an influence too on the public service. Tension between quantitative and qualitative approaches to IR was well documented (Lyons, 1976, Lawrence, 1980, Dressel [in Cope, 1979]) with pleas for balance to be maintained between competing constituents. Potential for conflict existed from a centralist approach to corporate management which could take decisions away from unit managers and put them into the hands of those who had no familiarity with issues concerned with the substance of learning and teaching in higher education.

IR is directed towards speeding up efficiency and assessing resources. It does so by providing information for enlightened decisions to be made although it has to be acknowledged that decisions often have to be made on grounds other than rational (financial or political for instance) which are not supported by information. In achieving its ends IR has to be concerned with the principle types of analyses used by management, essential data elements and their sources, measurement and its limitations, and critical thinking in relation to information.

The major planning problems and their solutions require IR workers to direct their skills towards successful management and operation of higher education. Planning is defined as 'not the process of speculating on possible events...an attempt through foresight to generate action necessary to realize desired results...a process of deciding on a course of action in order to make something happen which, without planning, may not happen...determines the objectives of administrative, effort and devises the means to achieve them' (Halstead, 1974, p.2). Key activities of IR are not methodological issues but information and planning and the way they are used in decision-making. Since these concepts were first put forward in the 1970s they have been sharpened by the impact of the 'information revolution.'

Roles and Functions of IR in Higher Education

Characteristic activities undertaken in IR are usually focussed on higher education although it has to be kept in mind that there is no single, all-embracing framework within which it can take place (Ng and Muffo, 1991). Five categories of studies have been identified: student studies, staff studies, curriculum studies, operational analyses and financial studies (Corson, 1975, p.157). As a service function IR often has to serve many constituents and sometimes has failed to fulfill its role in managerial efficiency and educational effectiveness in colleges and universities.

IR typically uses four kinds of data, namely,

(a) raw data in the form of discrete information (derived from staff and student records, etc) provides the core of many studies,

(b) operating reports, listings of raw data elements, e.g., enrollment lists and course results, are a more accessible form of raw data,

(c) statistical reports in the form of MIS summaries supply information at the level of costs centres; and

(d) analytical reports involve information, analysis and interpretation of the foregoing.

The data capture process provides the foundation of rational decison-making within the institution. Much data is already in existence in the

form of personnel records, students, payroll, asset registers, etc. Often data has to be collected as part of special projects, possibly by survey methods, modelling and simulation techniques. Possibilities for data capture in the organisation have increased greatly by the improvement of information systems.

IR has internal and external functions to carry out. Analyses and projections of institutional need, policy development and options for management are essential to the internal organisation. Program planning and forecasting, coordination of regional, state and national policies are part of the external environment in which IR is involved. To an extent there is also a role for IR in the public relations domain.

IR in the Wider Public Sector

The discipline orientation of colleges and universities is a handicap to IR in higher education. Senior management ranks are filled by those who demonstrate competence in their specialist field. In the public sector, by contrast, senior executive services emphasise general management skills, managers are moved between or within departments at frequent intervals. The principle activities of IR are well suited to public sector organisations in coordination within government departments. Although the ultimate purposes might be different the essential characteristics remain the same.

The two central concepts are information and planning but they articulate well with other aspects. The hierarchy of activities can be expressed as follows:

Information systems development
Database management
Statistical services
Policy analysis
Strategic and corporate planning
Policy development

In changing circumstances and at different times activities such as ministerial liaison, executive support and legal services can be accommodated to coordinate most of the major service functions of the organisation.

Information systems are the primary, and possibly the most crucial, element in establishing an IR approach to public sector management. Without an infrastructure of compatible computing resources which link together discrete parts of the organisation there is little prospect of achieving higher order tasks. The physical and technical aspects of information system development are closely aligned to administration of databases which reside on them, although the focus is on data organisation and access. Statisticians and policy analysts play an integrating role in interpreting data and turning it into management information. Strategic planning has assumed a prominent position in recent years. It was rarely mentioned in IR publications of the 1970s but is now well established. Detailed and thorough understanding of information and planning make IR researchers valuable to a public service organisation. The careful monitoring of efficiency, effectiveness and public accountability of the organisation can be ensured by capitalising on their skills.

IR in a Department of Education

In the Department of Education the IR contribution hinged on an eclectic view of the research undertaken. In the Assessment and

Evaluation Branch there were three tasks:

Monitoring curriculum change in primary, junior secondary and senior secondary schools;

Assessing student achievement in primary and junior secondary schools; and

Providing policy advice to the Secretary for Education and Board of Studies established to take responsibility for student assessment.

A range of research problems, requiring inventive solutions, was involved in addressing these tasks. An IR background was of use in the breadth it gave. A single methodological training in, for instance, experimental research would not have served as well.

A major policy objective in the 1980s was implementation of core curriculum (NT Department of Education, 1981). Evaluation of implementation was the first project to be tackled (Smith, 1984). All students were required to study a common core curriculum up to Year 10 in eight subject areas. A systematic evaluation was needed to review each subject curriculum. The general purpose was to gain insight and give direction to several interested parties so that improvements could be made both to the quality of curricula and the implementation process.

In the early stages questionnaires,rating scales, interviews, observation tests, discussion groups, case studies and document analyses were helpful. A second stage entailed development of an evaluation instrument which consisted of a structured interview schedule covering central questions of the study. The interview schedule was applied in all secondary schools at the level of principal, assistant principal and subject senior. Evaluation of core curriculum tried to keep in balance data collection with opinions about, and attitudes towards, policies.

Identification of policy issues by the evaluation was the link with IR. Three matters were highlighted:

Reporting student achievement as part of the junior secondary certificate;

The system used to record student progress; and

Discrepancies between assessment of achievement and reporting on the certificate.

These issues, amongst others, were directed towards the Board of Studies for discussion and recommendations.

One consequence of the introduction of core curriculum was the assessment of student achievement in English and Mathematics for Years 5 and 7 in urban primary schools. A criterion-referenced approach was used to assess student performance in relation to curriculum objectives rather than in comparison with other students' performance. There was no compulsion for schools to use the assessment package. Sensitivities in rural and Aboriginal communities led to the view that the quality and value of the assessment program was such that schools would, over a period of time, choose to use it. Test packages contained master copies of tests in loose leaf format which were copied and administered by teachers as part of the normal instructional process.

Validity of tests in the assessment program was dependent on how well instructional objectives were defined and whether test items adequately represented them. The

widely used amplified objectives technique gave a model for producing test specifications to delimit items written to measure a particular objective. From the testing program four issues arose:

The notion of mastery, arbitrarily set at eighty per cent was at variance with other models which were constructed on the assumption that ninety per cent of students should be able to master what is taught;

It was also assumed that all relevant content, behaviours and related factors can be defined which is open to question;

Efforts had to be made to improve the quality of test items; and

Clarification was required of procedures for reporting test results.

Construction of a criterion-referenced student assessment program with limited human and material resources was a large undertaking. In the controversial and often heated discussion which were part of the setting up of the program the IR background helped to focus on central issues and to discriminate amongst distractors, trivialities and irrelevancies.

The Board of Studies was established to oversight assessment and certification of students in NT primary and secondary schools. Its purpose was to provide a public statement of student achievement. The Board was composed of education professionals and lay representatives from the business community who often had limited and fixed ideas about student assessment. Early meetings of the Board included a learning process to assist member to comprehend some of the complexities of assessment. Components of the induction were; understanding the context in which assessment takes place, simple concepts of grading and testing, and comparison of student performance.

A Junior Secondary Studies Certificate for Year 10 students was one of the first projects oversighted by the Board of Studies. A degree of public controversy centred on criticisms often levelled that tests, grades, and certificates yield little useful information and that their use is often detrimental to education. Another issue was that grades other than the traditional letter or number were a liability to students applying for a job or higher education. The Board of Studies, because it had membership from the business community, was able to resolve these issues.

Assessment and evaluation fall within the orbit of IR although there was no separate office for IR. The role was exercised within the fabric of the organisation and influenced several crucial policy issues. The scope of activity was, however, tightly prescribed by the evaluation and assessment brief. There was more to offer than was possible within the terms of reference. Organisational structures are therefore a determinant of the extent to which IR practices can be successfully undertaken, in addition to knowledge, skill and individual enthusiasm.

IR in The Office of The Public Service Commissioner

Public service organisations are more liable to sudden and radical change than higher education insitutions, and none more so than The Office of The Public Service Commissioner. The Public Service Commissioner was the nominal head of the public service, reporting directly to the Chief Minister. Holders of the position, its duties and responsibilities,

were consequently highly likely to change with changes of political leadership. One such change involved a fundamental re-appraisal of The Office of The Public Service Commissioner (PSCO). The organisation had gained the reputation of being a super-personnel department giving expert advice to departments on personnel matters and interpretations of the Public Service Act. Some discontent was perceived with this role and it was thought that it might perform better as a smaller policy and planning group with an oversight of the whole public service. From an IR perspective a decisive input into the transformation was both possible and feasible.

The review and reorganisation of the PSCO (Smith, 1985) examined concepts, history, legislation, roles and function of the organisation. A cyclical approach was taken with participants contributing to a series of interviews which explored issues in increasing depth. The value of human capital in the public service was a recurrent theme and found expression in the raising of topics such as; responsiveness to government policy, relationships between the PSCO and the public service in general, and identifying elements of efficiency and effectiveness in the public service.

The review drew a distinction between the operational role of the Public Service Commissioner in fulfilling obligations under the Public Service Act and the strategic planning role that was necessary for improving efficiency and effectiveness. Personnel services, appeals and grievances, and industrial relations were part of the organisation that might be retained but scaled down. In order to achieve the planning role it was evident that there was scope for analysis, monitoring and forecasts of the changing state of the public service. Planning and information were generic terms in IR at the time, but not in the public service, so that impetus was given to their introduction.

Improving efficiency and effectiveness in the public service can be seen as essentially the process of doing things with and through other people. Management of people and expertise in personal interaction skills, only obtainable in the 'university of hard knocks', are regarded as being crucial. Acquisition of these skills, so the argument runs, comes from personality attributes and is unlikely to be learned by higher education. In contrast, planning identifies the key task as decision-making. Since logical and rational thought is ultimately capable of mathematical expression the most important activities are analysis, quantification, model building, simulation of alternatives, and assignment of probabilities in order to make a choice from options.

Introducing planning and information into the PSCO enabled examination of the aims and mechanisms of the public service. There was an immediate need to conduct a study which provide an overview of the service and which could be used as a platform upon which to build other work (Smith, 1986). The aim was to collect information and make a preliminary analysis of the elements of workforce flows. Data requirements were largely satisfied by the human resource database (INTERPERS) although some use had to be made of manually compiled, historical statistics. The elements identified were; recruitment, wastage, promotion and transfer. Each of these were cross tabulated with variables of; age, sex level of job classification, and educational background. Limitations were imposed on the findings by the variable quality of INTERPERS data but the scope of the study was

sufficient to encompass the whole of the public service rather than a sample.

Policy and planning implications from the study highlighted the interdependence of the main elements in human resource planning. Examination of stocks, recruitment and cessations as separate entities obscured the fact that adjustment to one aspect would be likely to affect the others. The trend in public sector employment was observed to be slowing. Ages and salaries of public servants were closely related to national norms. Recruitment, cessations and promotion painted a picture of a system that was not so much a 'free for all', as commonly supposed, but as a 'free for some'.

A series of studies was carried out which looked at each aspect in greater depth. Monitoring the complexity of the job structure was done through a review of establishment. Another study was completed on cessations. A cross-sectional model of the public service, based on a Markov Chain, began to show the ways in which flows of people within the system took place.

The potential for policy and planning of these studies could not be fully realised until they progressed from being descriptive to being predictive. Demand forecasts for labour in the public sector were required by the Public Service Act although none had ever been done. The need was for a demand forecast of labour requirements based on synthesis of what was available from information systems, statistical and other data sources to produce a statement which could be revised by regular, periodic appraisal. To carry out such a study required an integrated user-machine system for decision-support. The system would utilise computer hardware and software, manual procedures, models for planning and analysis, control and decision-making, and a database.

Data sources for the project (Smith, 1987) came from a variety of sources; historical, budgets, government policies, economic indicators, establishment profiles, summaries of organisational design and the growing movement in departments to produce strategic plans. They showed that in the previous seven years the public sector workforce grew by just less than twenty per cent, contrary to popular and political belief. Although no major departments were created in the period, and some declined in size, there was a steady increase in QANGOs. Disproportionate growth was observed in middle management and lower administrative grades. Projections of the data indicated a probable shake out of some jobs in these grades but that movements were likely to be marginal. Policy intervention would be required to curb growth in support services and direct it towards service delivery.

The PSCO created an opportunity to apply IR concepts, skills and methodologies to a range of legislative and policy requirements. Advice given to the most senior public service and political levels had its origins in IR. The experience also suggested limitations of IR. Senior ranks of the public service are highly politicised. A change of head of government had an inevitable flow-on to the Public Service Commmissioner and the work was abruptly transferred to a departmental setting.

IR in a Department of Health and Community Services

For a while mega-departments were the fashion as a means of saving on administrative overheads in the public service. It was thought that if financial, human resource and other support functions not directly concerned with service delivery were

grouped together then savings would directly follow. Numbers of staff in the public service would drop and, in real terms, budgets would be cut. The speed with which the mega-department was created brought together overnight one large, two medium and one small department. At the start there were therefore many task-oriented units operating largely in isolation from each other.

Within the new department a group was needed which could coordinate government policy with the maintenance of services. The group would also be required to provide accurate and reliable information for decision-support. Oversight of many operational and strategic matters and putting into place systems and resources was also the group's responsibility so that there would be:

A policy analysis and development base capable of quick responses;

A planning framework for the Department;

A program base for direction and coordination of activities; and

A range of information, management systems and local area networks for office automation.

All public service organisations were required to keep tight control over money and jobs. Simple questions such as 'How many people are there?' and 'Where are we spending the money?' required careful and systematic analysis. Similarly, questions such as 'Should we continue what we are doing?' and 'How well do we do our jobs?' required relatively impartial study which was free from the vested interests that so often frustrate public service intiatives.

High-level policy analysis groups are common to many public and private organisations. In a complex organisation each separate division does not have the human resources to deal with all policy issues, much less those which cut across several areas. Policy development was built on a systematic long-term approach which coordinated and planned for the orderly delivery of services. Initially, there was an urgent need for analysis of corporate systems, i.e., personnel and payroll. A new ledger, program budgetting and cost-centre management came from these initiatives. Examples of policy development projects were in Aboriginal Health, Open Correctional Facilities, Pensioner Concessions, submissions on behalf of offices of the Arts, Ethnic Affairs, and Sport and Recreation.

Strategic planning was a major activity of the policy and planning group. Three versions of the strategic plan were produced in the first five years (NT Department of Health and Community Services, 1988, 1989, 1990). Since such a task had not been previously attempted the first version documented all activities undertaken by the Department. The results filled four volumes of a very lengthy document that had little to say about the forward plans of the department. A second version, phased with the introduction of program budgetting, incorporated guidelines on targets, strategies and performance indicators. All of the Department's responsibilities were integrated into twenty four programs. It was a slimmer, one volume document which was of practical assistance to executive management and the minister holding the portfolio. The second version was still deficient in its treatment of planning horizons and quantifiable outcome measures. The third version largely corrected these shortcomings and added a statement of

organisational values. The process of developing a strategic plan was more than a contribution to creating a departmental identity, it also had the capacity to be rolled forward indefinitely into the future.

Information planning was closely related to strategic planning. A consistent, integrated information system had to be built and maintained. The information plan (NT Department of Health and Community Services, 1989[b]) was a pre-requisite to medium- and long-term investment in information technology. The information plan was notable in reflecting the shift of emphasis that has taken place in information systems generally away from the technical and towards the managerial. It used planning methodologies more rigorously than the strategic plan, particularly IBM's BSP and Arthur Anderson's Method/1. The information plan was comprehensive, thorough, oriented to the organisation rather than the technology and produced an information architecture that was reasonably stable and robust.

The absence of proper budgetting and financial planning for information systems had left a vacuum of urgent but unprioritised needs. Numerous small computer systems were developed in-house for, amongst others, the aerial medical service, claims and grants, the poisons register and regional immunisation which were undoubtedly better than the manual systems they replaced. A large local and wide-area network, supporting over 500 workstations was created during the period. Two medium-sized hospital systems were acquired in the first year. A Stores/Pharmacy system was tendered for and gradually introduced into all hospitals over a three-year period. A Pathology system was acquired and progressively implemented during the same time frame. All of these developments were, however, piecemeal and potentially wasteful because they were unable to communicate with each other.

An integrated hospital information system (HIS) was the main recommendation of the information plan. Further motivation came from proposed changes to the 1993 Medicare Agreement in which the Commonwealth government proposed a move to DRG/Casemix funding. There was also a strong clinical lobby for such a system. Several Cabinet submissions, the tender process and protracted inter-departmental negotiations delayed the start of implementation until January 1991. All nine modules of HIS were in place and fully functional by the end of 1992, placing the Northern Territory amongst the leaders in Australia of integrated hospital information systems. HIS was the largest single innovation during the life of the new department. In addition to the complexity of the project itself there was considerable controversy over the capital investment required which raises questions about the viability of initiatives of the kind in competing for shrinking financial resources.

Policy, planning and information systems were the main bases upon which IR was built within a service delivery department. Policy conceptualisation cannot take place without gathering information from various operational areas. There is much room for improvement in the area of management information systems. Cost-centre financial reporting, the growth of health indicators and casemix techniques partially fill the need. Improving power and speed of computers, and software of the 1990s are available to support more fully the MIS and decision-support role. When these elements are in place it will be possible to develop microanalytic

simulation models in support of health and community service policies.

Discussion

IR and Management

Above all else, a training in IR is a sound preparation for senior and executive management, in public service as in higher education. IR has the capacity to provide a solid grounding in, and understanding of, organisational processes which best equals any other form of management education, and is possibly of greater significance than its support function. In higher education, IR has the advantage of being able to capitalise on a substantial body of knowledge, scholarship and research. In other public agencies, the emphasis on service delivery and organisational culture often rewards and promotes according to very different criteria. IR is therefore one voice trying to be heard against others. The successes of IR in the public service context for this reason need to be marketed more vigorously.

A consequence of greater diversity of management style in the public sector is that at executive levels there can be little awareness of IR and what it can do, creating a credibility gap that constantly needs bridging. In circimstances where management is action-oriented there is a danger that IR might not be regarded as a valuable resource but as a dispensible peripheral luxury. The response should be to ensure that IR plays a major role in management education, marketing its accomplishments and having managers do the promotion. IR must also be capable of responding to external forces and not allow itself to become blinkered or narrow in focus.

IR and Decision Support

Advances in computer software have created new opportunties to develop the strategic planning dimension. One important product of the growing utilisation of information as a corporate resource is the potential for executive information systems. Synthesis of decision support activities has been the subject of detailed analysis and experiment, and exhaustive study (Denis et al, 1988) and integrated user-machine systems have been developed, even for PCs which could form the basis of executive information systems in both higher education and the public service. As a discipline, and because of its central interests, IR is in an ideal position to capitalise on these changes and promote a new style of management.

Decision support is the vital link between operational and management functions, especially in the public service which is labour intensive and primarily concerned with the delivery of essential services. Its objective is to provide executive management with tools and skills to achieve performance targets within available resources. Decision support is necessary to measure performance, decide on control actions, formulate new decision rules, and allocate resources. Summary information generated by decision support systems is needed so that trends may be observed, reasons for performance variation understood, and options suggested. In order to be effective, a firm commitment to the development of decision support is necessary from the head of the organisation.

IR and Financial Policy

The most intense activity in higher education and the public service centres is on the points at which financial decisions are made. Strategic planning and decision support are meaningless unless geared to financial

planning. Budgets are often regarded as objective statements of fact but more likely they lie at the heart of the political process (Wildavsky, 1979, p.5). This is the case not only between institutions but also within them. The relationship between IR and financial policy making is therefore crucial. The belief is common amongst financial directors that they are the ones who control decisions. Recognition of the fact, and an ability to cope with it, is a primary determinant of success or failure for IR within higher education and the public service.

Strategies employed by financial directors are frequently designed to take advantage of the fragmentation of organisational power. This can be done by guarding against cuts in old programs, playing both ends against the middle, inching ahead with some existing programs, the thin end of the wedge or numerous other means. Public service organisations have long experience in these sorts of strategies whereas higher education institutions, perhaps because the budgets are smaller, are less prone to them. The tactics often employed in financial decision-making are in many respects the antithesis of everything about rational decision-making that is embodied in the philosophy of IR. Yet, IR, if it is to have a strong and vigorous future, must learn to live in the harsh glare of financial reality.

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FUTURES PLANNING FOR TERTIARY EDUCATION CURRICULA FOR THE 21ST CENTURY: THE STUDENT AND THE PROBLEM

Graham J Logan
Associate Director, Christchurch Polytechnic

For quite some time, future analysts and popular social commentators have given us vivid accounts of the expected influence of technology on employment patterns and educational needs.[1] In industry, many of the changes they foretold are occurring now or have taken place; in education they are only just beginning.

We have had our attention drawn to the fact that our present system of education – in schools, colleges, polytechnics and universities – had many of its features determined almost a century ago. It developed around an early industrial model that is rapidly outliving its usefulness, both in education and in the industries where the model arose. From around the turn of the century, an era of mass production aimed at reducing the elements of manufacturing to simple, repetitive, machine-like tasks that could be handled by narrowly trained, interchangeable workers. This system of assembly-line production also required a high level of synchronization which called for centralised management, a strict sense of time, and rigid standardisation.

As agents of society, schools and colleges did their part to reinforce such values, as well as to impart skills and knowledge in a rigid, compartmentalised way. One of the primary purposes of education was to instil the characteristics of obedience, repetition and punctuality. Without these, manufacturing industries could not effectively function.[2] Mass production, however, carried within it the seeds of its own obsolescence for, inevitably, the routine, repetitive nature of the elementary tasks rendered them most susceptible to automatic processing and the progressive replacement of labour. This process of replacement has been going on for some time.

As early as the mid-sixties, the number of blue-collar workers in the United States was exceeded by the number of white-collar workers in technical, clerical and managerial positions.[3] Since that time, this change has gathered pace, affecting all aspects of the workplace and markedly altering the learning requirements of today's workers, more and more of whom are being called upon to solve problems, to think creatively, to interact skilfully with individuals and groups, and to cope with rapid change.[4]

The above learning requirements are compounded by another effect of the technological age in which we live: the sheer volume of information available means that people are less and less able to acquire and use it, even in specialised subjects. In some fields the rate of expansion of information is great enough to result in students (and teachers) knowing a smaller fraction of the relevant knowledge when they have finished a course than they did when they began it. Concurrently, the rate at which knowledge or information is becoming

obsolete forces people more and more to update continuously their understanding of a subject area.

For education it was really much easier when the body of knowledge for a given discipline was relatively fixed and stable, and thus could be conveniently handed on to students. However, teaching practices which rely on this model, where the teacher or lecturer acts as a conduit in conveying information to passively receptive students, are no longer adequate as a means of coping with the information explosion.

This particular aspect of the technological age has clear implications for education. In the first instance, students need to acquire, through method, practice and example, skills and learning which will not only enable them to cope with the demands of a course, but will also equip them to cater for some of their education needs after they complete the course. Because of the obsolescence of current knowledge, and the added difficulty of predicting the knowledge and skills needed in the future, the most important facility that students can acquire is the ability to learn on their own.[5]

In the second instance, teachers will be unable to rewrite continuously a changing syllabus and will therefore need to focus on enabling students to expand their own detailed syllabi within previously set parameters. More and more, a teacher or lecturer will need to be a coach, a manager of an instructional environment, who creates a learning context and helps students take responsibility for their own learning. More and more it will be the students who do the work in the classroom.

The perceived desirability of inculcating skills such as learning to learn and creative thinking is neither new nor special. Indeed, there is an unusual level of concurrence concerning student needs for an information society and, for a small slice of the population of western countries, such an agenda is pursued, often with significant levels of success.[6] What is more recent is the view that such higher order skills should be included in the general curriculum so that all students have the opportunity of acquiring them, and those sufficiently able can acquire them in large measure.[7]

The acquisition of these higher order skills can be seen as one of the principal curricular needs of the modern student.

The problem, on the other hand, is that little is known coherently about how these skills are reliably instilled or adequately assessed, and this problem seems to be part of the general difficulty that education lacks an adequate theory of learning: one with explanatory relevance or predictive power.[8] Furthermore, much educational research has focused on mental techniques for acquiring declarative knowledge which is concerned with content as opposed to procedural knowledge which is concerned with the ability to do things. Relatively little is known about learning strategies for acquiring procedural knowledge.[9]

There is a sense in which the transmission of procedural skills was more a feature of parts of the educational system that preceded the industrial era: for the crafts and pre-industrial trades the master-apprentice model of training relied on a subject expert transmitting refined manual skills to the learner. The process involved observation of correct technique, demonstration and a considerable range of tasks and exercises which developed the skills of the apprentice. Further, the knowledge acquired by a mature tradesman was

applicable to diverse contexts within a particular domain.

The analogy is incomplete. The skills that were learnt were all visually demonstrable. Techniques and artifices could be attended to and commented on. The intellectual skills needed today involve the invisible operations of the mind. They are not readily copied from observable examples. Further, much of the teaching of apprentices took place in one-to-one situations, and this luxury is not available for the purposes of cultivating intellectual skills in large numbers of students.

Still, some aspects of the comparison bear further consideration. The skills concerned were learned in context within a particular trade and there are arguments that higher order skills ought to be taught within a discipline rather than as a separate subject. This entails the view that if a discipline is important enough to be included in the curriculum then it needs to be taught in terms of the higher order skills underlying its creative practice. Such an approach maintains a link between the knowledge of a subject and the skills needed to be an able practitioner of it.[10] Examples of present educational practice that retain some of the features of this master-apprentice system are the teaching of surgical skills to medical students, and the supervisor-student relationship with respect to graduate research students.

Research which has compared experts and novices reveals that experts structure knowledge around general principles which consolidate information within their area of expertise. They employ problem-solving methods that are often particular to their subject.[11] Another distinction between modern "masters" and "apprentices" is that the former have a much more sophisticated awareness of their own learning styles and processes; they are able to direct these processes to some extent and to accelerate their own learning.[12]

The view that learning and thinking skills should be communicated as part of studying any discipline involves a major transformation of the educational system. There are considerable implications for institutional planning. In the first instance, there is a need for research into effective learning strategies and a need for developmental training of new and existing staff to enable them to communicate more than content, to reveal the procedures and processes of their disciplines, and to instil the habit of reflecting on one's own knowledge acquisition and learning approaches.

There is the matter of costs: most countries have considerable national 'ebts and when this is the case, the most promising funding situations which educationalists can realistically expect are those which do not increase the level of resources currently provided.

The curricula changes would incur considerable costs by the necessary research, development and training of staff, by the reconstruction of courses and programs, by the production of support material and by developing means of adequately assessing the attainment of students and the effectiveness of programs. Some of these areas stand in need of much further research and investigation. All of them involve significant expense.

On the other hand, as learners take more responsibility for their learning, it is expected that teachers become more productive in terms of the number of learners they work with. Furthermore, it seems certain that these learning styles will involve an increased use of information technology across the curriculum and an increased use of integrated projects using interactive and discovery methods that will encourage students to seek and present

their own findings. This technological dimension gives the prospect of further increases in productivity since communication technology multiplies the potential points of contact between teacher and students, while interactive multi-media technology enhances the effectiveness of independent learning. Finally an emphasis on learning rather than on teaching leads naturally to the need to assess prior learning and accord it recognition. This offers the opportunity to avoid costs of duplication.

In the introduction of curricula for the twenty-first century the challenge for administrators and planners will be to balance these costs and gains while catering for the needs of students and staff.

Notes

1 For example: Toffler (1970), Toffler (1980), Naisbett (1982), Naisbett and Aburdene (1985)
2 Toffler (1980) pp 45-46, (1970) chapter 18
3 Toffler (1990) pp 71
4 Toffler (1980) pp 400-402
5 Toffler (1970) pp 374-376
6 Reich (1991) chapter 18
7 Resnick (1987) pp 7
8 Ball (1991)
9 Derry (1990)
10 Resnick (1987) pp 36-37
11 Caillot (1991)
12 Resnick (1987)

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AN INFRA-STRUCTURE FOR THE PROVISION OF CAMPUS INFORMATION SERVICES

J Dockerill
Associate Director (Resource)
City Polytechnic of Hong Kong

Introduction

This paper describes experience gained at the City Polytechnic of Hong Kong in the development of its Campus Information Services. City Polytechnic is a relatively young institution. It was formally inaugurated in January 1984 and moved to its purpose built campus, from temporary premises, in October 1988. Since the Polytechnic was a new institution the opportunity was taken, wherever possible, to use the latest technology in support of both its academic and administrative activities. One of the first actions of the Polytechnic was to approve a Master Plan for the Development of Computing. The plan has evolved with the development of the Institution and with technological changes within the computing industry. It has however retained one of its basic premises that emphasis should be placed on providing connectivity amongst computer users.

Initially linking terminals and workstations to the Polytechnic's mainframe computers was achieved through the use of switching devices. These were quickly replaced by a single ethernet segment when this became available. This provided the basis for the design of a full campus network and the decision to proceed with a fully integrated network was taken some six years ago.

Fortunately, the decision to provide such a network was taken before the design of the new campus was finalised. Consequently, the structure of the campus buildings was adapted to support the necessary trunking and cabling required by the network. As a result the building contains a comprehensive trunking system which emanates from the Computer Centre, rises vertically to all levels of the building and then runs horizontally at ceiling level to a series of distribution points in the form of communication closets. Cabling is then taken through an underfloor matrix system which combines power, telephone and computer cabling and provides direct access points at regular intervals. Hence it is possible to install a computer workstation virtually anywhere throughout the campus and for the station to be connected directly into the campus network.

The network was fully installed and operational by the end of 1988 and currently supports approximately 3,000 workstations. All staff are provided with a workstation on the network and all students have access to the facilities through a range of public access workstations.

Following the successful installation of the network and its facilities, the Polytechnic has concentrated on the development and provision of information services to its users via the network. These cover a range of facilities from e-mail to an Executive Information Service.

This paper describes the philosophy adopted by the Polytechnic

in designing the network, its structure and operation and the services it currently supports.

The Campus Network

Philosophy

The basic philosophy adopted in the design of the network was to provide a facility for all staff and students in the Polytechnic that would make available access to computing support that was convenient, easy to use and reliable. The ultimate objective was for the network and its facilities to be viewed simply as another service similar to the telephone.

The two requirements for ease of use and reliability were crucial in determining the structure and operation of the network. Historically, computing facilities had been provided largely on the basis of meeting the needs of those in the institution whose course of study directly involved the use of the computer. In particular, the provision has frequently been based on the specific needs of the computer specialists within the institution. Such needs are usually highly specialised and certainly not convenient for the non-specialist user. The Polytechnic's approach was to separate the requirements for specialised computing and to concentrate general campus provision on the non-specialised user. The provision of a reliable and user friendly interface to the network services was required and this has been achieved through a menu driven access system which is described below.

Reliability was also considered to be of paramount importance. This led directly to the decision to use fully supported proprietary software on the network and to avoid the temptation to use public domain software developed by other educational institutions. The latter, although free of charge, has the major disadvantage of not being fully supported or updated.

Hardware Structure

Each department has a local area network (LAN) driven by its own network server. The latter is connected to an ethernet segment which in turn gives access to the central computer facilities. The local area networks are "thin-wire" ethernet, the ethernet segments are co-axial copper and the segments are connected via a fibre ring.

Each LAN includes additional peripherals, such as laser printers and plotters, which can either be shared by all users on the LAN or restricted to a single workstation.

The network provides access to all the main frame computers in the Computer Centre and also provides gateways to external services. The latter include direct access to Internet and also to the local packet switching service "DATAPAK".

Software Structure

The Software provided on the network is structured into five separate libraries as follows:

Departmental Standard Software
Departmental Special Software
Central Standard Software
Central Special Software
Information Services

The departmental libraries are held on the local departmental server. Their content is determined by the department concerned and therefore contain all the software commonly used within the department. The distinction between standard and special software depends upon the nature of the software. Certain items of software are restricted to run in a special

environment and are debarred from using some network facilities. Such software is designated as "special" and when invoked a special environment is established which essentially puts the workstation into a standalone mode. As problems of running such software in the network environment are solved, they are transferred to the standard libraries.

The central libraries are held on the central mainframe and are essentially a compendium of all the local departmental libraries. They enable users to invoke any item of software available in the Polytechnic which does not reside on their departmental server. Currently the network provides access to a total of over 200 items of software.

All information services software is held centrally and is available to all workstations throughout the institution.

Facilities are provided for the user to hold data on the departmental server. The general operating system used on the workstations is MS DOS and central storage is therefore achieved by allowing the user to open additional "drives" on the local server. Each user is provided with an "M:" drive which is password protected and is physically located on the server. Simply specifying the M: drive enables files, reports, worksheets to be established on the server. This has the obvious advantage of automatic backup within the Computer Centre, hence protecting data from accidental erasure on the local workstation. Similarly departmental drives, accessible to all staff within the department, and specified as "N", can be opened on the local server.

The software structure has other added advantages. To use a software package, the user selects the software from the menu on his/her workstation. The software is then downloaded to the workstation either from the local server or one of the central mainframes. The files holding software on the servers and the central systems are write protected and it has been possible, so far, to protect them against viruses.

With this arrangement it is also possible to upgrade software easily and speedily. If a new version of a software package is issued, the single central copy of the software is upgraded. If the software is held on the local servers, the upgraded copy is simply downloaded from the central source. This can be done automatically and overnight. Without the network and with separate copies of software held on individual workstations, the task of upgrading becomes virtually unmanageable. If, for example, a common software product such as Lotus 1-2-3 is upgraded, it would be necessary separately to upgrade the software on some 3,000 workstations; a task that would occupy the Computer Centre for several weeks.

Menu System

Access to all the software and facilities on the network is provided through a menu system. When a workstation is powered up, a menu is presented to the user. The user then selects the software library or information service required. Individual items on the menus can then be accessed simply through cursor movement and subsequent selection.

Information Services

The Information Services menu includes a wide range of information sources including Bitnet and Internet directories, software catalogues and

copies of Computer Centre newsletters, etc. Some of the more innovative services are described below.

Library Catalogue (Bauhinia)

The network provides access at all workstations to the Polytechnic library catalogue system. The latter provides the usual facilities for searching the catalogue including both keyword searching and a browsing mode. The system also includes a related search option which can identify other catalogue items that are related by subject matter to the item identified through the original search.

The catalogue also includes both English and Chinese items with the latter searched and displayed using chinese characters. The Polytechnic catalogue is one of the few available with this option and provides full compatibility between the use of English and Chinese.

Polydata

Polydata is a Videotex system which provides a general information service to members of staff and visitors to the Polytechnic. Apart from general information on the Polytechnic including structure, size, governance, etc., the system includes entries for all departments in the institution. Academic departments are encouraged to input information on courses, staff, research projects, special lectures and any other activities in which the department is engaged. For non-academic departments, the information provided is more specific to the area concerned. Hence the Library provides details of opening hours, book stocks and library regulations. The Academic Secretariat provides information on membership and meeting dates for the Polytechnic committees, resolution summaries of the Academic Board and information on academic regulations.

Polydata has Public and Non-public information. The former is available at all workstations, including the public stations in the general circulation areas. The latter is available only at staff workstations.

Polylink

Polylink is an e-mail system designed primarily for student use. However it also provides the communication link between staff and students. Students can use Polylink by simply quoting their student number, which forms the user ID, and their password. Messages can be sent to other students (or groups of students), staff or broadcast to all registered users. Messages are held on the system for 10 days only.

There has been an overwhelming response from the students to Polylink and the system is very heavily used. It has been extended to overseas mail through the Internet link and students are now able to communicate to any e-mail user throughout the world. The success of Polylink has resulted in a large number of broadcast messages that are difficult to scan. As a result a system of Bulletin boards has been incorporated into the system each covering a different area, for example, Macintosh users, environmental protection groups, buy and sell, Music, etc. The Polytechnic administration has also opened several boards accessible by staff giving details of administrative notes and medical benefits. In fact the Personnel Office has ceased to issue administrative memoranda in printed form and uses only e-mail and the bulletin boards for this type of information.

A recent addition to Polylink provides access to news and general

interest topics offered over Internet. Currently some 1,500 such services are offered to users on the network.

Module Locker

This system is incorporated into Polylink and provides the opportunity for staff to issue assignments and course notes to students via the network and for students to subsequently submit their work in electronic form direct to the lecturer's account. The system enables staff to set deadlines for the submission of work and to keep track of the progress of students in assignment work. It is planned to implement a subsystem to maintain a record of the student's performance on his/her assignments and assist in the final preparation of end of years reports.

Citylink

This provides connection to information services within Hong Kong offered through the DATAPAK public switching network of the Hong Kong telephone company. Currently this includes information on foreign currency exchange, fax and voice directories for Hong Kong and China, flight arrivals and departures at Kai Tak Airport etc. These are offered free of charge. A further and more comprehensive range of information services including news and market reports is available on a subscription basis.

Directories

The network provides access to a number of information directories including Bitnet and Internet node addresses, internal telephone directory, software catalogues and a buyers guide to computer equipment.

Executive Information System

The Polytechnic has recently installed an Executive Information System designed to provide senior staff with information on all aspects of the operation of the institution. The system installed is a proprietary software and was chosen for its ease of use and flexibility in presenting information to the non-expert user.

The system derives its information from the data processing systems that have been in operation at the Polytechnic for several years. Essentially EIS works by extracting data from these systems and presenting the information in a form which the executive needs for his/her day to day decision making.

Data is extracted from the operational files into an EIS database. The process of extraction is relatively simple and can be done using in-house software or through the use of "pipelines" which are provided as part of the EIS package. The system provides two types of report to the user. The first is completely pre-determined and is in the form of "screens" of information which are pre-defined both in structure and content. They correspond to the information presented to the executive at his/her workstation in the form of computer screens.

The database contains both the data extracted from the operational systems and the structure of the screens. Updating the database with current operational data also updates the screens which will form the final presentation. Updating of the database and the associated screens takes place overnight and the results are automatically downloaded to the server. When a workstation is switched on the information on the server is further downloaded to the station and

the updated screens are available for immediate interrogation. Since all enquiries are handled locally on the workstation, response is immediate.

The system also provides an interrogation system which enables the user to access directly the EIS database from the workstation. Access is provided through a system entitled "Execuview" which connects the workstation to the mainframe and enables the user to extract and structure his own reports from the data held on the EIS database. The only limitation on the information available to the user is imposed by the original structure and content of the database.

Responsibility for the development of the EIS resides with the Management Information Office in the Polytechnic. They are responsible for designing the content of the database, designing and constructing the screens of information that will be ultimately delivered to the end user and liaising with users to identify growing requirements for more information to be made available on the system. The technical aspects of systems implementation are handled by the Computer Centre who are responsible for general systems support and also take care of the downloading of operational data into the EIS database.

EIS is only available at a limited number of workstations on the network and is password protected. To improve systems response and to limit traffic on the network, the screens of information provided are held on a separate server to which the EIS stations are connected. This structure cuts across the normal organisation of the main network. However a software connection can be provided to add any workstation to any sub-network wherever it is physically located in the system. Hence there is a logical network structure which can be superimposed on the physical layout of the system. EIS has been implemented by imposing a separate logical network for those stations permitted access to the system. Invoking EIS on these stations automatically switches the workstation to this alternative sub-network and connects them to the EIS server.

At present three information systems are provided on EIS. The financial systems were the first to be connected to provide budget and expenditure information. These were closely followed by information on staff timetabling and student numbers. Further systems are planned on personal information including information on staff development.

Summary

To summarise, the Polytechnic has established a substantial facility in the form of the campus network which has already had a major impact on the operation of the Polytechnic and the means whereby information is made available to staff and students. This has been a major achievement which was made possible largely because the institution was newly established during a period when the full potential of computer networking was just emerging.

Since the Polytechnic was a newly established institution, development planning, in the early days, was in the hands of a few senior staff who of necessity adopted a very centralised approach to the provision of facilities. This, without question, was the key factor in development to the network which has to be centrally planned if it is to be implemented quickly and successfully.

The Polytechnic has now grown to become a major institution in Hong Kong with some 10,000 full-time

equivalent students. It has a total of approximately 1,000 senior staff, four faculties and a college for sub-degree work. The centralised approach to planning and the provision of academic services, adopted in the early years of the polytechnic, has given way to a decentralised system with increasing responsibility being delegated to departments, faculties and the college. Despite these changes, the overall operation and structure of the network has remained largely unchanged. However, the growth of the network to its present size has imposed considerable strains on the Computer Centre and the situation is becoming unmanageable. As a result, plans are in hand to transfer responsibility for the management of the departmental LANs to the departments. The Computer Centre will take responsibility for the connection of the LAN to the central network and for the provision of all central services.

The process of decentralisation has cost implications since it is necessary to duplicate staff resources in departments to take care of local facilities. The Polytechnic is therefore establishing a system of "Regional Computer Centres" in the faculties and the college which will establish satellite facilities on a faculty/college rather than a departmental basis. This should combine the benefits of delegating management responsibilities for the Local Area Networks whilst retaining some of the economies of scale of centralisation.

The information services provided are already substantial and there is a danger that users are becoming swamped with the data available. Information is also critically time dependent and resources need to be devoted to ensure that it is updated regularly. Users quickly ignore all network sources of information if they find even a small portion of the data out of date. This problem is being tackled by emphasising the use of bulletin boards which can be maintained individually by departments and also have the facility to automatically delete information after a given period of time set by the provider of the data.

Another problem with the growing use of the network is the extent to which the menus have grown and, as a consequence, have ceased to be user friendly. This has been alleviated by allowing users to tailor their own individual menu to contain only the software they commonly use. They only have to enter the more comprehensive menus if they wish to use software outside their normal range of applications. A "hot key" facility has also been installed which enables users to switch to commonly used software simply by using a single key depression. Again the "hot keys" are programmed by the user for his/her own environment.

The major hardware development envisaged for the network in the future will be an increase in the use of fibre rather than coaxial cabling to expand the capacity and the bandwidth. The major change anticipated in the software environment is the introduction of Windows on the network. Window versions of individual software are already available for users. However, there is an increasing demand to introduce a Windows environment for the network itself.

EDUCATIONAL PATHWAYS IN A MULTI-SECTORAL INSTITUTION: CHALLENGES AND STRATEGIES FOR THE FUTURE"

Dr. Ng Gan Che, Senior Lecturer,
La Trobe University College of Northern Victoria

Mr. Con Pantazis (deceased)
Dr. Raj Sharma
Swinburne University of Technology

Introduction

The trend to develop several pathways for education, vocation and training by tertiary education institutions to meet the needs of the employment sector is growing, especially in the industrialised countries. In a high technology and information-based world, research-based vocational education and lifelong education are becoming increasingly important in providing value adding opportunities to the employment sector and they are growing in demand. This phenomenon is attributed to the growing need for a multi-skilled labour force or 'generalists' who possess good analytical and communication skills and, who are creative and innovative in meeting the challenges of the Information Age (Naisbitt and Aburdene, 1990). Australia, like other countries, is responding to this trend as indicated by the several recent government reports on the future direction of tertiary education, such as the *Foundations for the "Clever Country"*, *Young People's Participation in Post-Compulsory Education and Training*, and *Higher Education: The Challenges Ahead.* The overall thrusts of these documents were to improve access to and greater participation in quality tertiary education.

In line with recent government policies to provide greater access to and equity in the tertiary education sector and following the recommendations of the Finn Report, the Carmichael Report, the Deveson Task Force Options Papers and the Mayer Report which had identified the significant role of the Technical and Further Education (TAFE) sector in providing the vocational education and training needs for improving and maintaining the competitive edge of Australia's industries, many higher education institutions are strengthening their program articulation through credit transfer arrangements with TAFE. Equally, many higher education institutions treated these arrangements with disdain for they argued that they would lower the standards and quality of their programs.

Aim and Objectives

The overall aim of this paper is to examine the strategic amalgamation between two institutions in Melbourne: a higher education institution (Swinburne Institute of Technology)

and a TAFE institution (Prahran College of TAFE or PCTAFE) which was reconstituted to form the Swinburne University of Technology (SUT) in July 1992. Several events occurring in the tertiary education sector provided the catalyst for the amalgamation. It is interesting though to note that PCTAFE senior management who had foreshadowed the implications of the restructuring of the higher education under the Dawkins agenda on the TAFE sector were already either discussing the prospects of amalgamation or establishing a centre of excellence for Furniture Studies. On what basis did PCTAFE senior management decide that an amalgamation with a higher education institution could assist them to achieve a better educational and managerial outcome than standing alone in this era of dynamic changes? How did Swinburne Institute of Technology become PCTAFE's chosen partner? What strategic plan was in place to facilitate the amalgamation of the two institutions? Did the amalgamation fulfil the objectives of PCTAFE senior management? These questions which constitute the objectives of the paper, and which have implications on futures scanning of the tertiary education sector, will be addressed.

Challenges In the Teritiary Education Sector

There are several environmental factors which challenged PCTAFE senior management to review its position strategically in the light of the changes in the tertiary education sector. These factors, which are influenced by the complex inter-relationships of political, economic, social and technological constraints, comprise the following:

* *The Dawkins reform*

The Dawkins reform agenda as contained in the 1989 document entitled "Higher Education – a policy statement" triggered off a spate of institutional restructuring in the Australian higher education sector. Catchwords or phrases like economies of scale, efficiency, effectiveness, accountability, performance, quality of education, articulation, pathways, equity and access, and so on became the daily mantras of the sector. *The relative funding model is used to allocate financial resources based on the teaching and research profiles of the institution.*

* *National Training Reports*

The four reports on national training needs mentioned earlier have emphasised the need for TAFE institutions to play a greater role in vocational education and training and that their programs should be articulated with the higher education sector. By implication, the four reports seemed to suggest a restructuring of the TAFE sector so that the sectoral institutions can provide opportunities for multi-entry and multi-exit (MEME) academic, vocational and training pathways for all with the relevant entry qualifications.

* *Economic issues*

The current economic downturn and the declining public sector spending in Australia also affected the funding of TAFE. Like in the higher education sector, the funding of TAFE in terms of capital and recurrent funding is now based on the development of program profiles. The situation is further exacerbated by competition from the

private training organisations who are now permitted to compete openly with TAFE programs.

As aptly put by Lockwood and Davies (1985, p.9), "in times of adversity and uncertainty the need to exercise foresight is increased since the pressure for external control and determination of programs increases under these conditions". In the case of PCTAFE senior management, the adversity and uncertainty posed by the above factors seemed forbidding, and especially when there were indications that the State Training Board, its principal employer, was considering the restructuring of PCTAFE. PCTAFE senior management was aware that the college's survival depends on meeting the local community needs. Unfortunately, owing to the economic decline, businesses and industries in the Prahran municipality were either contracting, facing closure or had moved to other more prosperous areas. To some extent, this has effected a contraction in the provision of commercial and customised training courses as well as the relatively lucrative consultancies in the Business Studies area. However, this was counter-balanced by an increase in enrolment in the community and social services area.

The situation was exacerbated by the fact that there were strategic restrictions on PCTAFE itself to act unilaterally since it was governed by the State Training Board (STB) both legislatively and administratively. Its operations were confined by the STB to prescribed geographical areas, levels of programs and disciplinary fields. It was only in 1990, through the Victorian Education and Training Act, that TAFE colleges have been provided a legal basis to be self governing bodies and are protected from interference in internal matters such as its need to develop comprehensive and long term planning to cater for the changing nature of education and training in the 1990s. Hence it was not surprising that no strategic plan has been developed to cope with the sudden changes in the education and training environment. Nor was there any environmental scanning to collect and analyse data on the dynamics of the situation. Under such circumstances, it would be useful to look at the constraints which PCTAFE had faced in developing a strategic plan.

Constraints In Developing The Strategic Plan

In trying to develop a strategic management plan, PCTAFE senior management have recognised the following problems:

* *Lack of time and data*

Owing to heavy teaching and administrative commitments, members of senior management have found it difficult to have the time to develop a comprehensive strategic plan. In the absence of a decision support system for scanning the dynamics of the environment, PCTAFE senior management felt futile in not being able to possess the baseline data like demographic, socio-economic, and mobility patterns to establish a plan for responding rapidly to the changes occurring in the tertiary education sector. Furthermore, there were limited funds to support time release for staff to participate fully in the development of the plan.

* *Ambiguities in institutional goals*

2. There were ambiguities in the institutional goals which were often multiple and contradictory, such as the

access and equity goals where the disadvantaged students have no access into buildings. Furthermore, the funding arrangements between the STB and TAFE colleges normally encourage short-term budgeting and with the STB specifying funding priorities which may not coincide with those of the institution.

* *Central control*

Owing to central control by the STB until the end of 1990, much of the institutional data collected were used to provide a feedback to STB to account for the monthly expenditure allocated to the institution by STB on a yearly basis. Information concerning the external environment was absent. Yet, there was tremendous pressure from the STB for PCTAFE senior management to indicate their future direction for the College, otherwise the STB would take the initiative to hasten the process of restructuring.

* *Management style*

The management style of PCTAFE senior management was based on the values of team work and open communication. In the development of a strategic plan, they would have liked all staff concerned to have a shared vision of the future direction of the College. As such, ideally the strategic plan should be developed in-house by all members of the College where open and frank discussions are to be advocated. However, events developed so rapidly in the tertiary education sector in the years 1990-91 that what had been regarded as proactive thinking on the part of PCTAFE senior management were soon translated into reactive actions at best or inactions at worse.

Given the above constraints, PCTAFE senior management decided to employ a person or persons to assist in the development of their strategic plan. The brief was to undertake initiatives directed by the senior management for purposes of developing a strategic plan within a time frame of six months. These initiatives included a literature review of the current restructuring of the tertiary education sector and its implications on TAFE colleges, informal discussions with staff and students about their visions of the future direction of the college, development of a comprehensive questionnaire on the growth, academic and equity profiles, amalgamation issues and prospects, marketing plan, and resource profile of the college, and the conduct of brainstorming sessions with senior management using SWOT analysis.

The strategic planning process was implemented mid-way when the STB compelled PCTAFE senior management to negotiate with Swinburne Limited for full institutional amalgamation. Before the resource profile of PCTAFE could be strategically examined, the college had already signed an agreement for amalgamation with Swinburne in December 1991. Never the less, the initiative to develop a strategic plan, though incomplete, had greatly assisted PCTAFE senior management in their amalgamation negotiations and subsequently fulfilled their objectives of jointly establishing a multi-sectoral institution with Swinburne which was later to be reconstituted into a university of technology with multi-entry and multi-exit (MEME) points built into their education and training programs.

PCTAFE senior management had chosen to amalgamate with Swinburne on the basis of the analysis of the strengths, weaknesses,

opportunities and threats (SWOT) confronting the college. An elaboration of the outcomes of the SWOT analysis would assist in understanding better the background to the establishment of a MEME university.

Outcomes Of the SWOT Analysis

The internal strengths of PCTAFE were identified as follows:

* Decentralisation of administration by centres which are managed by forward looking, proactive, dedicated and competent staff.
* Reputation in a number of program areas which include childcare, show business, records management and insurance.
* Strong links with relevant industries and employer groups have been established and these groups have often used the consultancy services of PCTAFE.
* Well serviced by public transport with easy access to central metropolitan facilities.
* Staff have the will and capacity to fulfil College mission and the expectations of the community, STB and College Council.

The internal weaknesses were identified as follows:

* Lack of corporatism.
* Historically the college had been proportionally underfunded, creating a weak college-wide organisation and this contributed to a lack of strategic planning, policy statements and decision making. For example, there was no coherent system to monitor unmet demand owing to a poorly resourced administrative infrastructure.
* College Council had too many distractions to focus on the tasks of achieving the College mission and the promotion of its interests.
* Staff morale was relatively low owing to the lack of funding. There was inadequate staffing and resources, lack of accessible and adequate accommodation, and poor quality and dilapidated facilities. This was compounded by the feeling of an uncertain future in the event of amalgamation with another institution.
* There was limited physical space for future growth.

The external opportunities were identified as follows:

* Amalgamation with Swinburne to form a multi-sectoral institution would enhance the competitiveness of PCTAFE in the FFS and overseas students market place.
* Good prospects for increasing the recruitment of full fee-paying students (FFS) and overseas students, which would help to provide more places for disadvantaged and disabled people.
* Legislation to integrate further education into the TAFE system.
* Changing political climate, with implications on urban renewal, revamping public transportation, and technological innovations, would provide opportunities in course design and development in those areas.
* Restructuring of workplace and advancing technology would contribute to innovations in curriculum development, course delivery, training and creation of a skills supermarket in which PCTAFE is well-placed to tap.
* Potential funding for disadvantaged groups (example, for aboriginal students).

The external threats were identified as follows:

* The fear of being 'swallowed' by a larger institution through amalgamation.
* Most institutions, especially the larger ones, were positioning themselves to dominate the educational market place while the smaller players, owing to lack of resources, could only wait to be swallowed up by the former.
* Fierce competition from private providers offering competitive prices for training programs.
* Establishment of industrial skills centres which compete with TAFE for students.
* Multitude of funding sources would lead to decreasing recurrent funding sources.
* Fear of change, such as change of government, constantly changing policy (especially Social Justice Policy) and the reintroduction of student fees.
* Lack of information or bombardment of disinformation makes strategic planning the more difficult.

In view of the above SWOT analysis, PCTAFE staff and senior management were of the opinion that, in order to strengthen PCTAFE's organisational and academic structures, an amalgamation with a multi-sectoral higher education institution with a complementary mission and profile would be an inevitable course of action. Many staff believed that such an amalgamation would improve their present working conditions and status, provide greater flexibility and diversity in teaching opportunities as well as their career development. Through the amalgamation, they also wanted to realise the establishment of a MEME institution where full articulation of the education and training programs offered is provided at all levels.

Strategic Profile Of a Meme Institution

PCTAFE fully merged with Swinburne on 1 January 1992 and both institutions were reconstituted on 1 July 1992 to form Swinburne University of Technology (SUT). At the same time, a strategic planning exercise was implemented to review the structural and procedural processes that are appropriate to a university of technology. The exercise was expected to be completed by the end of this year.

SUT was reconstituted as a mature multi-sector educational and training institution consisting of four faculties, one school and a college of technical and further education. The institution offers education and training in technologies, business, the social sciences and the related humanities to Australian and overseas students. The SUT's stated mission is "to provide a continuum of educational opportunities from initial vocational education and training to postgraduate masters and doctoral degrees and to support the community through research, consultancy and continuing education" (SUT internal circular, May 1992). The mission is to be achieved through the maintenance and enhancement of teaching and research inputs, processes and outcomes so that SUT students are equipped with a depth of education, a breadth of vision and the qualities needed to contribute to the development of a prosperous, equitable and just society.

The strategic profile of SUT is distinguished by the following key features:

* a multi-sectoral structure, comprising both higher education and TAFE;
* emphasis on curriculum integration and enhanced articulation from apprenticeships to doctorates so as to facilitate flexible and cumulative, life-long learning;
* applied emphasis of educational programs at all levels, with strong interactive links being maintained and developed with the private sector for training, education, research and development;
* emphasis on applied and entrepreneurial activities to attract resources and share facilities and staff with a wide range of public and private sector clients; and
* operation of a multi-model learning and flexible delivery system through the use of communication and computer technologies to make courses more accessible and cost effective.

The above key features of SUT have been regarded by its senior management as essential ingredients of a university of the twenty-first century. How these features operate within the MEME institution are best illustrated by SUT's pathways strategies and its multi-modal learning system.

Pathways Strategies

The following strategic priorities have been identified for the development of an effective TAFE-Higher Education pathways program at SUT:

* "enhanced credit transfer and articulation arrangements between TAFE and higher education;
* development of independent learning systems including computer based learning initiatives, tutored video instructions and [other relevant instructional technologies] ...;
* provision of staff development programs based on agreed staff development plans and priorities to meet Swinburne's staffing needs over the next decade;
* enhancement of electronic communication between campuses and computer networking;
* implementation of an integrated management information system" (SIT and College of TAFE, 1992, p.4)

These priorities are aimed at achieving full articulation based on the concept of integrated curriculum development which involves a collaborative approach to course planning, design and delivery for maximum course articulation, and the resultant transfer of credit across the sectors in both directions. The collaborative approach preserves the fundamental orientation of curricula in each sector. It also avoids compromising or distorting the needs of the other sector such as the achievement of recognised vocational outcomes for students studying in TAFE, and the attainment of appropriate academic standards for students studying in higher education.

The integration of curriculum of the two sectors is effected through the collaborative development of articulation enriched conversion units, which can be offered as alternatives to existing units through a student centred flexible delivery system. These conversion units have been designed to provide sufficient breadth and depth to meet the requirements for students to gain the maximum benefits of articulation.

This process, for example, will facilitate a 1:1 credit for 1.5 years in 3 year programs and 2 years in 4 year programs across a course range in all

the academic units of SUT. Complementing and enhancing the pathways and articulation program is the development of a multi-modal learning network which facilitates the delivery of conversion units by means of a flexible, student driven delivery system. In the long run this delivery system will be cost effective as it will not tie up resources in the provision of ongoing, additional, mandatory classroom based delivery. The multi-model learning network has available a variety of teaching/learning modes. There are basically four modes: domestic, local centre, sub-core and core modes, and they are characterised by the location in which learning occurs. For example in the Domestic Mode, the student will learn at home using a variety of learning resources including print, audio, video and computer. In the Local Centre Mode, students will meet with small groups for tutorials, discussions or independent learning. In the Sub-Core Mode, students learn in traditional classroom situations and have access to library facilities, interactive media, learning centres, computer laboratories and student amenities. And in the Core Mode, students attend a fully developed campus which will provide traditional lectures, classes, tutorial and laboratory sessions as well as multimedia learning laboratories, computer laboratories and a full range of student amenities and services. Therefore, in a MEME institution as exemplified by SUT, there is flexibility and portability of learning where one can enter and exit at whatever level one chooses without the constraints of location, employment or academic qualifications.

Conclusion

This paper examines the strategic decision of a small TAFE college, PCTAFE, which was struggling for survival in the era of rapid changes in the tertiary education sector. The recently granted independence in 1991 by the STB to PCTAFE to managed its internal affairs and to develop a strategic plan for its future was cut short by both political and economic events which compelled PCTAFE to amalgamate with either its fellow TAFEs or a higher education institution. The strategic thinking of PCTAFE senior management then was to establish centres of excellence for Furniture Studies and Business Studies as well as to form links with a multi-sector higher education institution to diversify and to articulate its educational and training programs. The vision was to establish a MEME institution which provides flexibility and portability in education and training at all levels of the educational system. Hence, the staff of PCTAFE were amenable to the idea of full merger with a higher education institution which has a complementary mission and programs.

PCTAFE's vision was realised when it became fully merged with Swinburne in early 1992. By mid-1992, both institutions were reconstituted to form the Swinburne University of Technology which has a common mission to provide a continuum of educational opportunities from initial vocational education and training to postgraduate masters and doctoral degrees and to support the community it serves through research, consultancy and continuing education. Though PCTAFE senior management was unable to complete the strategic plan in time, their vision of a MEME institution was in place and they were

able to share this vision with Swinburne which, incidentally, also have similar ideas. Hence there were no conflicts on both sides since they have a shared vision of a MEME institution.

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QUALITY OF STUDENT OUTCOMES: CONCEPTS AND ISSUES OF MEASUREMENT

Dr. Ng Gan Che, Senior Lecturer,
La Trobe University College of Northern Victoria

Associate Professor Ken Heskin
Dr. Raj Sharma
Swinburne University of Technology

Introduction

The current government's concern in the quality of tertiary education was triggered by public disquiet towards the deteriorating state of Australian tertiary education (Lindsay, 1992). This public perception of the tertiary education environment can be attributed to several factors. These include the trend towards mass tertiary education, a dramatic increase in demand for tertiary places as a consequence of high retention rate of year 12 students, economic rationalism, and the demand for public accountability in tertiary education as the national coffer goes deeper into the red. As a consequence, there is public demand for efficiency and effectiveness in the tertiary education sector. Student outcomes assessment is one of the processes that has been recently identified as being more relevant in indicating an institution's performance and accountability.

Assessing the quality of tertiary education is by no means a simple procedure. There are no absolute or simple values either within the tertiary education system or, indeed, over time in relation to the concerns of any of the key player groups or stakeholders. The ground keeps shifting. The Higher Education Council's (HEC) document (1992) *The Quality of Higher Education – Discussion Papers* has recognised both the conceptual and practical problems and issues of assessing the quality of tertiary education. Of late, these problems and issues, which generally have been centred on the definition and measures of quality, have been widely debated in Australian academic circles in particular (refer to the HEC Discussion papers for a comprehensive account of the debate by the different stakeholders: students, academic staff, employer unions, etc.).

Following Kerschner (1987), who suggested that the increased diversity of students commencing programs mean that input measures alone will be insufficient to obtain a complete picture of quality, Hall (1992) argued for a focus on outcomes in quality assessment. Hall averred that the main concerns of the clients -the students and the employers - are on quality outcomes. Hence, institutional aim at satisfying the needs of our clients (Laver, 1992). This view is apropos to the HEC's current emphasis on the quality of student outcomes as a

fundamental pathway 'to understanding how each of the processes within institutions are organised and evaluated ...' (HEC, 1992, p.6). Underlying this focus, the HEC has adopted three broad principles as the basis for assessing the quality of student outcomes. These are listed as follows:

* 'the attribute acquired by graduates provide the ultimate test of the quality of the system to which they have been exposed;
* the judgements about the value of the individual processes that combine to lend to quality outcomes rests with the universities - the internal stakeholders, and to an extent, with the peers; and
* the major criterion to be applied to the judgement of the quality of the individual elements of learning programs should be linked to the contributions that it makes to the staged development of the students' (HEC, 1992, p.7).

Aim And Objectives

The overall aim of this paper is to discuss the concepts and issues of assessing quality of student outcomes partially in the light of experience in conducting a pilot study and informed by some initial feedback from that process. The pilot study was undertaken at Swinburne University of Technology (SUT). Underlying this central aim, the paper will address the following themes on quality in order to provide a comprehensive framework for a better understanding of the concepts and issues involved:

* an overview of quality assessment in the tertiary education sector;
* the theoretical concepts of quality assessment, especially relating to student outcomes;
* the issues involved in assessing quality of student outcomes;
* methodology in outcomes assessment as applied to the SUT pilot study.

Quality Assessment: An Overview

The concern for quality in Australian tertiary education dated back to the late 1970s (The Australian College of Education, 1978). Other countries are also concerned about quality within their tertiary educational systems. In fact, the quality of education has become an international issue and has drawn much attention from governments and tertiary education institutions worldwide in the 1980s following the appearance of a spate of alarming reports about the declining quality of general education in socio-political and pedagogical publications (Malkova, 1989, p.34). Debate and research activities on quality definition, measurement, and issues abound in the United States (for example, refer to Bogue and Saunders, 1992; and Pascarella and Terenzini, 1991), the Organisation for Economic Cooperation and Development (OECD) countries (Kalkwijk, 1991; Vroeijenstijn, 1991) and other parts of the world. The question of what is quality is best put by Pirsig (1974) as follows:

"Obviously some things are better than others ... but what's the 'betterness'? ... so round and round you go, spinning mental wheels and nowhere finding any place to get traction. What the hell is quality? What is it?" (Pirsig, 1974, p.184).

For the past twenty years, this question of what is quality has been asked in both the business and education circles. Some say that

quality, like beauty, is in the eyes of the beholder. Some say one knows quality when one sees it. Different definitions have been proposed (see for example, Astin, 1991; Mayhew, Ford, and Hubbard, 1990; Goodlad, Soder, and Sirotnik, 1990), and Fisher, 1990). Thus the concept of quality is connotative and varies in meaning according to the context of use. This appears to be true within stakeholder groups as well as between them.

While recognising the multi-dimensional character of quality, Bogue and Saunders (1992) however warned that one should not detract from the fact that quality can be defined, measured, and "can be used to improve our impact on students and to their growth as well as to enhance programs and services". To them, quality is about the "conformance to mission specification and goal achievement – within publicly accepted standards of accountability and integrity" (Bogue and Saunders, 1992, p.20). They advised that the debate on quality should not contribute to the proclivity of inaction by institutions or "acting on the possible while awaiting perfection" (Bogue and Saunders, 1992, p.19). Instead, as a learning community, it should be part of a discovery process for all educational institutions.

Within the Australian context, there has been great interest in quality assessment issues. As mentioned in the introduction of this paper, several government sponsored documents on quality and performance of higher education were released over the last three years for public debate. Seminars and workshops were also held to deliberate upon the multi-dimensionality of the quality issue. Different models of quality assessment, especially those used in the OECD countries, were examined in the HEC (1992) document. The HEC was of the opinion that quality assessment in Australia should be based on: (a) "the need to encourage the search for excellence" (HEC, 1992, p.13), and (b) objective evaluation by an independent audit body to comment and report on the effectiveness of quality assessment practices adopted by different institutions. It is also acknowledged that there is a positive relationship between the level of funding of higher education and its quality. As such there is no cheap way to safeguard quality (HEC, 1992, p.15).

In a comprehensive review of the literature and empirical research studies on the assessment of quality in higher education, Tan (1986) identified three main approaches that were commonly adopted for quality assessment studies. These comprise reputational studies, objective indicator studies, and quantitative correlates studies. Reputational studies are subjective evaluations from academic staff, heads of departments, or deans as a basis for rating programs. Objective indicator studies assess programs through the use of objective variables such as academic research productivity, financial resources or student outcomes. Quantitative correlates studies have a primary purpose of identifying variables that are correlated with academic staff or program quality and they include department size, the amount of federal funding, library resources, academic salaries and academic research productivity. It is suggested that all three approaches have contributed towards a better understanding of quality in higher education.

Outcomes Assessment: Some Theoretical Concepts

The mounting criticism of the quality of tertiary education has spurred research on student outcomes over the last decade. The emphasis on student outcomes assessment is due to stakeholders' or consumers' interest in knowing what the return is on their investment since the costs of tertiary education are now identifiable and measurable (Terenzini, 1989, p.645). In fact as far back as 20 years ago, Mortimer (1972) had predicted that outcomes assessment would be one of the main concerns in American higher education.

Given the diversity of institutions in the tertiary education system in terms of their histories, missions, goals, values, and environments, it would be surprising to find a single concept for student outcomes that fits into all these institutions. Pascarella and Terenzini (1991, p.5) recognised the difficulty of developing a conceptual framework for presenting the different types of institutional outcomes. A recent study in the United Kingdom by Johnston (1991) partly illustrates this point. Johnston obtained the retrospective evaluations of nearly 9000 1980 British graduates of their degree courses. The findings indicated two possible routes of analysis, one based on graduate's satisfaction in becoming an educated person, the other related to their ability to obtain a good job. Graduates differed in their perspective of the relative importance of these outcomes. So even within the ranks of one major group of players, namely students, at one particular point in time, the picture is not uni-dimensional.

After reviewing the various literature dealing with the taxonomies of student outcomes, Pascarella and Terenzini (1991) considered Astin's model as being the most influential in defining the scope and content of student outcomes, although others like Brown and De Coster (1982), Ewell (1984, 1985a, 1985b, and 1988), Hanson (1982), and Parker and Schmidt (1982) had developed a similar genre of taxonomies.

According to Astin (1973a), student outcomes can be conceptualised along three dimensions, namely type of outcomes which can be cognitive or affective, type of data which can be psychological data or behavioural measures, and the time span. Cognitive outcomes are concerned with the use of higher-order intellectual processes as exemplified by knowledge acquisition, decision making, synthesis, and reasoning. Affective outcomes deal with attitudes, values, self-concepts, aspirations, and personality dispositions. Psychological data describe the traits or internal characteristics of the individual. These traits are usually assessed indirectly by means of a test or examination. For example, an individual's level of skill in critical thinking can be inferred from responses to a questionnaire. Behavioural measures are obtained from direct observations of the individuals. Although Astin's taxonomy illustrates the complexity of measuring student outcomes, nevertheless, it can be used as a guide to define the parameters of student outcomes.

In the case of Australia, the HEC document similarly suggests that an important focus in the characteristics of quality of higher education would be its outcomes. The document indicates that graduate outcomes can be assessed in terms of the acquisition of the following attributes:

* generic skills which all graduates should acquire from their respective institutions irrespective of their discipline or field of study and these include learning skills, effective communication, logical and lateral thinking, problem solving, intellectual rigour, and other socially relevant qualities such as knowledge, team building, and life-long pursuit of knowledge;
* "a body of knowledge" which should be mastered in a particular discipline or field of study for the level and type of awards and which facilitates the acquisition of new knowledge;
* professional/technical or job related skills which can be applied by graduates immediately to their employment and these include ability to work with minimum supervision in the specific field, and to apply learning to the workplace.

Once the parameters of the quality of student outcomes have been defined, the techniques for its measurement can be developed.

Issues In Measuring Quality Of Student Outcomes

In assessing the quality of student outcomes, it should be recognised from the outset that this task must be ongoing to take account of changing circumstances, that it is multi-faceted, and that different key groups may have different perspective determined by their different needs and agendas at a given point in time. In addition, the entire situation is inherently dynamic rather than static since the pursuit of new outcomes, arrived at by whatever process, will inevitably create new perceptions of success and failure within the system by all interested parties. For example, the employers' wish for more readily useable, job-related skills in graduates can only come at the expense of other attributes which current graduates possess. The value of these more latent attributes may only become evident when graduates lacking in them enter the workforce, or have been in the workforce for some time and face new and unpredictable challenges to their resources. Then the whole cyclical process will begin again *ad infinitum*.

Terenzini (1989, p.646) has identified three major areas of concern that need to be considered in assessing the quality of student outcomes:

* definitional issues,
* organisational and implementation issues, and
* methodological issues.

Definitional issues:

Historically, the term assessment implies more than one measurement or approach to evaluation. An assessment of student outcomes, then, involves the acquisition of multiple evidences of those outcomes. These evidences, as suggested by Pascarella and Terenzini (1991), are provided by the following: verbal skills, quantitative skills, and knowledge of specific subject matter; general cognitive competence and cognitive skills; self-conception and self-evaluation; pychosocial characteristics and personality traits; attitudes and values; moral reasoning, moral judgement, and moral behaviour; educational attainment; career choice and career attainment; economic values and benefits; and nonmonetary benefits, life satisfaction, and quality of life. Furthermore, the definition of assessment is connotative and this may contribute a significant threat to the

success of any assessment effort. In any assessment, there are three important questions to be considered, viz. what is the purpose of the assessment?, what is to be the level of assessment?, and what and who is to be assessed? The clarification of these questions needs attending to before commencing the assessment. Otherwise, misunderstanding and conflict may emerge to mar the progress of the assessment procedure.

Organisational and implementation issues:

The assessment of quality should be fully supported on an institutional-wide basis and as such proponents should mobilise support right from the beginning through collegial consultation. It is important that the assessment is seen by those concern as a vehicle for individual and institutional improvement rather than as a hidden agenda to evaluate individual faculty staff, or to cut budgets, or retrench staff and programs. To gain the confidence of those concern, it is essential to clarify and to specify the data to be collected, by whom, and for what purposes. It is also useful to indicate how the data will be used, to whom it will be available and under what conditions it will be made available. Also the assignment of coordinating responsibility should be made clear. Overall, the whole tone of the procedure should be made positive and less threatening as much as possible.

Methodological issues:

Bogue and Saunders (1992) have listed the following issues which relate to the design and development of a student outcomes assessment process:

* *Matching assessment to outcomes definition:*

Given the great variety of outcomes assessment models available from both the institutional and commercial domains, a fundamental question to ask is whether the assessment model or approach matches the outcomes desired and defined by the institution. Trade-offs may be necessary for an institution using a commercially published instrument.

* *Ensuring validity and reliability:*

This involves the scientific rigour of the research design, especially in the sampling procedure. To ensure validity and reliability of the data to be collected, the sample design should provide a clear description of the target population, the objective procedures used to select the sample, the stratification decisions, and the procedures used to minimise the dangers of bias through non-response. It is important to involve the faculty in the design and implementation of the process as well as in the interpretation of results. For any reasonable level of reliability in assessing a particular student's outcome, at least 8-10 items have to be attributed to that outcome variable.

* *Selecting score options:*

This depends on the research objectives and the survey instrument used. Since multiple measures will be used in the assessment procedure, the scores must be compatible so that the results can be meaningfully be interpreted.

* *Evaluating time and money costs:*

There are four areas to be considered in evaluating time and costs. They are the assessment instruments, administration of the assessment procedure, analysis and coordination, and the start-up costs.

* *Isolating sources of bias:*

Bias may arise from design limitations, measurement difficulties, and statistical hazards. Sample size must not be too small to encounter problems of validity or statistical stability. Hence it is prudent to start small, perhaps on a pilot basis, to explore the problems and issues of conducting the assessment.

* *Examining levels of difficulty:*

The pilot study should be able to elicit any inherent difficulties that have been overlooked in the design stage.

The HEC (1992, p.9) has recognised the difficulty of measuring the generic attributes of graduates. In principle, outcomes like higher-level conceptual skills, independence of thought, and intellectual curiosity are less readily measurable than the more specific skills and knowledge. As a result, it is not surprising that the more readily measured parameters of competency-based learning have been recommended for outcomes determination of higher education. To what extent compentency measures are valid determinants of quality of student outcomes is still vigorously debated in the higher education sector.

Methodology Used in SUT's Pilot Study

The National Board on Employment, Education and Training (NBEET) report (1991) entitled "The quality of higher education" identified three main interested parties in the outcomes of higher education, namely, employers of graduates, staff and students of the higher education system, and finally, governments on behalf of the community. The NBEET's second category is not appropriate for assessing outcomes as it confounds providers of the service, namely staff, with recipients, namely students, and is therefore essentially two distinct interested parties. Government's interests too, certainly at present, are essentially dependent on and subsidiary to the satisfaction of the other groups. We therefore believe that we take note of the views of the three groups in our research, namely the primary providers of higher educational services, academic staff, the primary recipients of the service, students and the secondary recipients of the service, graduate employers. At a seminar which we organised at SUT to foster debate and cooperation on these issues under the auspices of the Australasian Association for Institutional Research (AAIR), some participants pointed out that students are not only primary recipients, they are also secondary providers since they bring resources to the educational process in the form of individual ideas, experience, and support for fellow students. We gratefully acknowledge that perceptive contribution and accept its validity.

Having clarified these general issues, our first task is to identify which generic skills are perceived to be:

* important in the eyes of our three interested parties and

* the proper concern of universities.

To this end, we have looked at overseas attempts to measure outcomes (for example, see Pascarella and Terenzini, 1991; and Bogue and Saunders, 1992), at the specific concerns expressed in the discussion documents such as the HEC document on quality and so forth. We then put together a pilot questionnaire which specified possible outcomes in the form of generic skills. We will also seek the views of respondents within the three groups in the pilot work to enable us to extend or otherwise modify this list as appropriate.

The results from this questionnaire will enable use to identify common concerns among our three interested parties as well as differences in perceptions of the proper outcomes of university education. It seems probable that there will be areas of both agreement and disagreement on the propriety of specific concerns for outcomes of higher education and these need to be known in order to inform and further the debate on quality.

To the extent that the three interested parties lack concensus on the perceived proper outcomes, then there will be endemic frustration with the system and/or its products. These issues will then have to be debated and resolved until it is appropriate for the higher education system to resolve them and to the extent that it is capable of resolving them. One of the problems one might anticipate is that it is perhaps inevitable that any perceived shortcomings of graduates will be attributed to their university experience, which is the final exit point in a three-tier system of education. University academics are unlikely to regard that an an equitable perception if the complaints refer to knowledge and skills which, in their view, students should have acquired at an earlier point in their education.

The next stage in the research focuses on specific generic skill outcomes. We endeavour to measure the perspectives of our three interested parties on these outcomes. We have developed a pilot scale to measure communications skills, which is a generic skills outcome commonly mentioned as desirable in previous work and clearly fundamental to success at almost any level of graduate functioning. The final page of the questionnaire is an open-ended question which seeks the stakeholders' thoughts on extensions or improvements.

One of the things that eventually struck us in our deliberations and determined the proposed shape of our research is that enhanced communication skills is an outcome that one would predict that all interested parties would claim as a desirable outcome. None the less, employers constantly refer to skills in communication as a common deficit among graduates. The problem of definition in measuring the quality of outcomes has been noted as endemic. We therefore have assumed in our approach that there may be a problem of definition with this commonly used term and indeed that this will probably be the case with other so-called generic skills. These may transpire to be a series of skills with limited spheres of general application. Thus different parties may focus on different communication skills while all claiming allegiance to the same flag in this respect.

We have attempted to define communication skills outcomes in three ways. Our first and second ways basically refer to "the words" of communication – speaking to and writing for other major groups of individuals. Following this logic, we thought it appropriate to tap what we

might call "the music" of communication, namely the ability to mix socially with others in the various major categories as a fundamental lubricant of communication. What we are trying to do is cover all the logical possibilities for major categories of communication skill and we intend to use the responses from our three interested parties to construct a matrix of communication skills outcomes from the perspective of the three interested parties. Of course, we intend to develop scales to assess other outcomes in the future, informed by our experience in looking at communication skills. We believe that our approach is suitable for general application within the higher education system and we hope that it will provide a useful methodology to assist the evolution of the debate on the quality of outcomes in higher education in Australia.

Problems With Measurement

A pilot study to trial and evaluate possible measurement instruments to probe the issue of quality of tertiary outcomes was conducted in mid-1991. At the time of writing the data is being processed for analysis. However, preliminary feedback from respondents to our questionnaire and observations by our research assistant indicate that the instrument which we are developing to measure the importance which members of our three stakeholder groups attach to various generic skills outcomes of university education is a useful and valuable one which will require minor modification only to yield good quantitative data.

An instrument was also developed to endeavour to tease out the meaning of "communication" to members of the stakeholder groups in terms of the modes of communication involved (verbal, written, social) and the kinds of target groups for whom the communication is intended (people of the opposite sex, people of a different educational background and so forth).

The rationale for developing a measure of one generic skill at this stage was:

* to pilot a measure of generic skill in order to facilitate and guide future research into other generic skills;
* in recognition of the frequency with which the skill of communication has been raised as an issue in the debate on the quality of outcomes in tertiary education;
* in anticipation of the expected result from the first scale investigating generic skills in general that all stakeholders would endorse communication as a desired outcome.

Our feedback on the communication skills questionnaire highlights the general difficulty which we had anticipated, namely that all stakeholders tended to endorse every aspect of communication as important and therefore found the questionnaire repetitive and some respondents commented on the "motherhood" nature of the questions.

The problem is vexing since

* all stakeholders appear to endorse the importance of communication skills; the students say they regard them as important, the academic staff say that they endeavour to impart them and the graduate employers emphasise their importance in the workforce;

* despite this unanimity, however, the employers consistently mention communication skills as notably

problematic among the graduates they employ.

Our best guess is that a similar state of affairs will probably emerge with other "broad-band" generic skills such as problem-solving, which has also emerged with some regularity in the quality debate. Our assessment is that the various stakeholders are using the same words in respect of some generic skills, but are perhaps referring to essentially different processes under the same rubric or different aspects of very broad generic skills.

It was our anticipation of this problem which led us to attempt to break down the broad concept of communication into a number of component parts in our pilot study, as described above, and to endeavour to quantify the importance which stakeholders attributed to these aspects as outcomes of tertiary study. This essentially logical approach, however, still does not break through to the core of the problem since all parties still appear to regard the component parts with relatively equal and high desirability.

For these reasons, it seems that the most productive approach to unravelling the intricacies of this paradoxical difficulty will lie in a more qualitative rather than quantitative approach. What we need try do is to allow the stakeholders to express the perceived nature of their understanding of various generic skills as they operate within the ecology of their own environments. An analysis of these responses should indicate the particular skills which different stakeholder groups are focusing on under the rubric of a given generic skill. In turn, such an analysis should point to means of solving the difficulties which graduate employers are now experiencing, although one should not prejudge either the locus or the nature of such solutions until further data become available.

Conclusion

Changes in the world economic order as effected by global political power shifts and technological advancement have brought about changes in employment patterns, education, social interactions, and lifestyles. In the United States, it is common to have several job changes within one's working career. As such, academic specialisation in a discipline could handicap a person's career path where the acquisition of generic skills and multi-skilling is in vogue. In Australia, employers are saying that the area of generic skills is a problem. The implication is that the educational system is not producing the right kind of product. Those responsible for the management of tertiary education have definitely heard the message clearly, as reflected by the release of several government-sponsored documents on the quality of higher education.

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INTEGRATING TOTAL QUALITY MANAGEMENT INTO REVIEW OF EDUCATIONAL INSTITUTIONS

Dr. K. K. Navaratnam
Evaluation & Strategic Audit Unit
Department of Employment, Vocational Education, Training & Industrial Relations

Mr. Rory O' Connor
Manager/Quality System New Zealand Qualification Authority
Wellington, New Zealand

Abstract

In order to achieve an incremental improvement through institutional review, educational organisations must consider supporting management strategies to assist in the review process. Integrating TQM into the institutional review process can lead to success in linking the vision and mission of an educational agency to its management and operational strategies. This paper describes the theoretical perspective of integrating institutional review and TQM processes for achieving continuous improvement, and how the concept of TQM can be used as a planning tool to improve the processes and outcomes of the institutional review. It characterises the management goals necessary for making continuous improvement in the quality of performance of all the processes, products, and services of the educational institution. This paper also advocates that the institutional review process is, was, and always will be, a way of planning, analysing, identifying, and implementing appropriate management strategies for continuous improvement. Thus, every process in the review can be improved through linking the activities to the central focus of an educational institution through TQM. It concludes that educational institutions that integrate TQM into their institutional review can have a strategic advantage in making continuous improvement in the provision of quality learning and services for their customers.

Introduction

The reputation of an educational institution is too precious an asset to leave to chance. An institution seeking to create and maintain a high reputation needs to have good planning, implementation, management, review, and quality strategies based on institutional vision and mission (Carlson & Ranney, 1992). Planning establishes purposes, guidelines, strategies, and constraints for an institution. Implementation is

the process of causing the institution to behave in accordance with the established purpose, guidelines, and strategies. Management is a complex, problem-solving process. Review evaluates the institution's performance and determines the needed adjustments in planning and implementation. Quality strategies create an environment that encourages institutions to both look for and find a better way of meeting the needs of internal and external customers (Ansoff & McDonnell, 1990).

Total Quality Management

Total Quality Management (TQM) is a management tool that can be used to help an enterprise or agency work through impediments to progress (Stein, 1991). It can be implemented at the level of a department, a functional branch, or the entire institution. It brings the customer-supplier perspective into an institution. TQM emphasises the understanding of processes, the importance of variations and measurement, the behaviour of the customer and the suppliers, and the involvement of management and employees at all levels of an institution (Bone, 1991). In implementing TQM, strategic analysis and planning are important to develop procedures for tailoring the techniques to the needs of a particular institution, through a series of step by step problem solving techniques. TQM is aimed at turning good organisations into quality driven organisations by influencing people, input, process, and output of an institution (Besmowski, 1991). The planning aspects of TQM are designed to improve its implementation prospects. Thus, TQM can provide a planned strategy for making real improvements in any organisation.

Educational Institutional Review

Institutional review has become a regular function of educational institutions, especially at post-secondary level. It is a method of identifying opportunities for continuous improvement and leads to a consideration of needs, competition, obstacles, or challenges (Maasen & Sharma, 1992). One can formulate several different varieties of institutional review which vary in degree and purpose. It is a participatory activity of people who are responsible for institutional management. It is often seen as planning for self-development of an institution to meet the requirements of stakeholders and is generally used to assist management to define goals and objectives, set priorities, simplify processes, reduce waste, resolve problems, and take initiatives (Collins, Cockburn, & MacRobert, 1991).

Institutional review involves a systematic analysis and interpretation of existing educational and managerial events and processes within an institution to bring about improvements in the delivery of services and products to various customers (Vancouver Community College, 1986). It aims to provide information that can be used in identifying institutional policy formulation, planning and decision making, implementation, and auditing (Mohrman & Cummings, 1989). In an educational context, institutional review bridges the gap between the community and educational agencies by focussing on the strategic issues that are important for institutional growth and expansion while meeting the needs of various stakeholders in the communities. It focuses on the effectiveness, efficiency, and social

indicators of educational programs and services and the management processes.

Types and levels of institutional review

Generally, institutional reviews are of three kinds depending on who is conducting them: self-study, internal review, and external review (Pardey, 1989). Self-study review is conducted by the management of an institution to identify the possibilities for development and improvement and to determine the effectiveness and efficiency of the institution. In the self-study process, management, together with the responsible persons or group determine the direction and activities, procedures or processes to be investigated, and develop a time frame. In fact, the scope of the institutional review is basically decided by those involved in the self-study. Internal review is the review undertaken by or on behalf of an institution, by a person within the organisation but who does not have any direct role in the development process. External review is the review undertaken by an independent certification body or similar organisation. Although the three types of reviews differ in the purposes for which they are conducted, the basic methodology adopted in the review process is the same.

In educational settings, there are four categories of institutional review: system review, policy and programs review, process review, and product and service review (Arter, 1989). A system review encompasses the management strategy used for meeting the needs of stakeholders. It can be characterised as a review of the operation and management of the entire educational institution, including activities such as planning, implementation, measurement, and improvement. A policy and programs review includes the review of current policies, procedures, and operating instructions that are specified in strategic and operational plans, activities, and performance indicators. A process review is an in-depth review of a particular process and activities that are performed as specified in the procedures and work instructions. A product and service review is a detailed examination of the characteristics of graduates, and other products and services unique to the educational institution before or after they are accepted by the customers. The four kinds of reviews can be performed either wholly or in part within any educational institution. In spite of the differences and commonalities among the four levels, they are all important in establishing a mechanism for the identification of opportunities for improvement in educational institutions.

Steps in institutional review

Institutional review is a planned approach to determine the improvement possibilities within procedures and activities in relation to inputs, processes, and outcomes of an educational institution. Unless efforts are made to measure the relationship between actual and expected inputs, processes, and outcomes within an organisation, it is impossible to detect the gap between what is intended and what is achieved in terms of performance. The philosophy of institutional review is to insist on the need for improvement with objective evidence. The scope and the level of an institutional review are variable factors that have to be considered in

the planning process. Further, institutional review requires systematic planning, performance, reporting, and follow-up. A structured approach to the review process and proper training of personnel is a key component in ensuring as effective review. In educational settings, the institutional review process may involve the following steps: (i) environmental scan, (ii) collection of data, (iii) analysis and interpreting of data, (iv) development of strategic and operational plans, (v) implementation of plans, (vi) auditing activities and processes, (vi) continuous improvements. While each step is likely to be different from the other, these steps are common to all, regardless of the types of review. Further, how each step is executed will have a direct effect on the other steps.

Integrating TQM into Institutional Review

Implementation of both institutional review and TQM is a systematic process made up of definable stages and events and counter events. As a result, strategic focuses are translated into practice, a value system, leadership practices, a mission statement, goals and objectives, and a plan which will ultimately lead to the achievement of an organisational purpose. However, integrating the institutional review and TQM in an educational context is not a simple task. The integration involves interactions of people, processes, outcomes, and demands the articulation of the vision and mission into continuous improvement strategies to provide transition from planning to implementation (Schobert & Brown, 1990). Analysis of environment and organisation factors, including strengths, weaknesses, opportunities, and threats (SWOT), must be identified to establish a rationale for the integration. Such rationale could facilitate the incorporation of the key elements: (i) customer perspective, (ii) mission and objectives, (ii) improvement opportunities, (iii) control of the process, (iv) leadership and teamwork, (iv) performance monitoring, and (vi) continuous improvement. These factors and the elements could be used to determine the fitness and readiness of an educational institution and its management for the integration of TQM into the institutional review.

There are commonalities between the purpose of the institutional review and TQM. They both set periodic objectives, assign resources, review accomplishments at the completion of the implementation period, analyse objectives that were not met, and then set new objectives for the next phase of the continuous improvement. In addition, both require the ability to get individuals and groups within the institution to perform specific activities in order that objectives are translated into actions. It is fact that every educational institution is part of a larger system that is constantly changing. From this point of view, an organisation needs to develop coherent short and long-term management strategies at all levels of the institution. For this reason, TQM must be part of every step in the review process and it has much to contribute to an integrated process. Both institutional review and TQM emphasis on consolidating management and resources to gradually bring internal processes and systems under control. This indicates that the review and management process can go hand-in-hand to achieve the organisational purpose of an educational institution. That is, institutional review can

effectively achieve the defined organisational purposes with the support of TQM.

The interrelationship resulting from the integration process could be considered as the most important by-product that is necessary to achieve self-sustained growth and development in an educational institution. Further, the integration link can be strengthened through investigating strategies and processes that are common to institutional review and TQM planning. The very essence of success is the alignment between institutional review and the TQM process. The integration process needs to have a future vision. The development of such a vision and a clear understanding of what an organisation is trying to achieve is the key to the long term success of integrating institutional review and TQM. A common organisational vision could lead institutional review and TQM to a new era in the institutional development process and this can become a positive outcome of the integration process. Thus, current thoughts on the integration of institutional review and TQM could be considered as a new direction for institutions. Those pioneering this idea could make a wave of innovative improvements in the management and administration of people, programs, processes, and outcomes. An understanding of what happens to an organisation undergoing changes is an essential component for the integration process. For this reason, performance standards must be established for measurement and monitoring of the integration process. Performance standards, when properly used, will have a significant impact on the success and well-being of the educational institution. These performance standards could be linked to the institution's ability to identify those goals which are practically feasible and provide on-going direction and focus for the allocation of resources and skills.

Benefits of the Integration

Organisations concerned with establishing a promising future need a conceptual framework for managing discontinuities, a systematic approach to making strategic decisions, and a methodology for guiding their implementation. Integrated TQM strategies are driving quality improvements in many manufacturing and service industries, and are facilitating the implementation and strategic management process. They ensure that the goals are articulated and focused, directions are mapped out, resources are optimally allocated and factors critical to successful performance are identified and managed. As a part of the integration, the processes can be defined and a framework for quality deployment can be developed to give functional guidance that will result in further institutional development.

The success of the institutional review could be determined by the degree to which the TQM process is integrated. That is, desirable outcomes could be achieved in the way it is managed and the way people approach their job. There may be improvements in many processes through the integration of TQM into institutional review. For example, senior management can initiate actions to ensure continuous quality improvement initiatives through people, process, management focus, performance, and customer concerns. Further, it could bring about constancy of purpose regardless of political, economic, or other influences and suggests a full partnership with leaders, customers,

work force, suppliers, and other interested people through a shared purpose and vision. While the need for institutional review is fundamental, the need for consistency, coherence and discipline in the management of the review is no less important as can be demonstrated from the integration process.

The quality improvement process must fit with environmental factors whenever possible. Both institutional review and TQM entail a continuous assessment of the physical and socio-economic as well as internal environment within an institution. They require a structure with a flattened authority system that is connected by interactive work groups and managed by leaders with vision, exemplary behaviour, motivation, empowerment, and support. Institutional review and TQM could be used to articulate and achieve the organisational goals and objectives. Quality must be the fundamental aspect of the educational institution and must be utilised at every stage of the planning, management, and measurement process. Thus, quality concepts can be introduced into relevant aspects of institutional improvement philosophy in a way that directly supports the organisational purpose of the educational institution.

Institutional review and TQM set guiding principles for continuous process improvement to maximise the efficiency and effectiveness of the educational institution. In fact, objectives for integration can be set according to the capacity of an institution to plan and manage the desired changes. Both utilise a participative management and team process with an emphasis on leadership and management. Thus, everyone in the institution can contribute to the effectiveness and efficiency requirements established through institutional review and TQM.

Conclusion

Institutional review sets the general directions, uncovers possibilities, and guides and controls the direction in which an organisation will grow and develop. Total Quality Management is pragmatic and a result-oriented management strategy. The results of the integration of institutional review and TQM are expected to be quality products and services, new markets, satisfied customers, new strategies to respond to emerging challenges. TQM converts the institutional review into growth, success, and self-sustainment. Institutional review ensures that an organisation does the right things and TQM makes sure that the things are done correctly. Institutional review is creating the opportunity for improvement and TQM is helping to achieve it.

Institutional review and TQM need each other; they can be supplementary and complementary to each other in successful educational institutions. The overall success of an institution is dependent on both institutional review and TQM. Institutional review and TQM can be the guiding lights to an institution in deciding where and how it guides its future. Therefore, they merit serious attention as strategic tools, not only to set the direction of an organisation but also to achieve benefits. Educational institutions integrating TQM into institutional review will be aligned, horizontally and vertically, in pursuit of strategies aimed at continuously improving effectiveness, efficiency, and social indicators. However, as in any quality improvement initiatives, the

litmus test of integrating institutional review and TQM is yet to come.

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RPL BUILDING EQUITY INTO THE ASSSESSMENT MODEL

Ms. Mary Jones, Equity Unit
Dr. Raj Sharma, Planning & Information Services
Ms. Susannah Thompson, Equity Unit
Swinburne University of Technology

Introduction

How do we improve the quality and delivery of education in the 21st Century? What are the important factors that will change and shape the future of tertiary education?

For many years educators have been arguing that education is not just about formal education; it is really a process, a process experienced throughout life. Until recently this remained an esoteric argument, that everyone could acknowledge but few could translate into tangible outcomes. However, with changes in the employment profile and the employment market place escalating costs of education; institutions having to be more accountable and more entrepreneurial with their budgets, a new philosophy is emerging. A new "customer" approach is being carved out and with it the voices of marketers are being heard and a new university "corporate" image is being moulded. It is within this climate that Recognition of Prior Learning (RPL) is being acknowledged as important because RPL is an effort to "link the producers (in the case of higher education, the producers of educational services) to genuine public needs and wants" (Heeger, 1983. p.8).

As further stated by Heeger (1983) — "the very concept of prior learning is recognition of the changing learning needs of an aging population, which has been accumulating a far more complex learning background than higher education has had to deal with in the past" (p.7).

This paper, through an analysis of the literature, attempts to answer the questions: What is prior learning? How do we assess prior learning? What are the institutional and equity issues concerned with Recognition of Prior Learning?

What Is Prior Learning

Ekstrom (1983) states that prior learning is the term that "applies to any learning that took place in the past, but is only now being assessed" (p.69). She argues that some but not all prior learning is experiential. This is an important point as often prior learning is used synonymously with experiential learning.

Through a more careful definition of prior learning, it is possible to reflect this difference more accurately in the instrument used to assess and measure the scope and quality of the learning. In fact, Ekstrom (1983) suggests that there is both intentional and incidental learning that occurs and that the ease of assessing the learning is based on whether or not the learning has in some way been supervised.

Intentional Learning

Where intentional learning is tied closely into educational outcomes and these are somehow supervised, assessment of learning can easily be identified and verified. This occurs not only in formal educational settings but also in courses that are conducted in, for example, the workplace.

The difficulty arises where intentional learning occurs but clear educational objectives are not supervised and therefore the description of type, scope and quality of learning must come from the individual learner.

Incidental Learning

Incidental learning is a by-product of some other activity. A major problem in assessing incidental learning is that the individual concerned is not always aware of the learning that has taken place. The learning outcomes are certainly not defined but the activity can be supervised. Therefore, incidental learning that takes place at work can be verified in terms of scope, experience and quality. The task for the educational assessor is to translate this information into the educational objectives of a relevant course.

A major problem exists where incidental learning "happens" in an unsupervised environment. This type of learning usually occurs in conjunction with living and developmental experiences and often people do not realise that they are learning as they progress through life's experiences. A prime example of incidental learning occurs with women who work in the home. These women usually exercise great ability in the 3 learning domains, cognitive, psychomotor and affective, as well as being able to demonstrate an ability to progress through the taxonomy of thinking as outlined by Bloom (1956) Yet how do we assess these abilities? How do we assess the management, budgetary and life skills that these women exhibit? How do we transfer these abilities into credits in a university course? How do we maintain the "quality" of the courses and the educational credibility of the institution?

These are the major questions posed by educators and which have to be answered through some form of assessment of abilities.

How Do We Assess Prior Learning?

The major thrust in Britain has been to make a clear distinction between prior learning and prior learning achievements. The former is accepted as a process which occurs before, or as part of, any experiential or formal learning as distinct from the outcomes from the learning process. It is these outcomes that have then been used as the assessment focal point.

Miller and Daloz (1989) theorise that in order to be credible and accepted by educational authorities, experiential learning must be:

- "measured for quality;
- evaluated for quality;
- translated to appropriate academic symbols".

They suggested that this can be achieved by:

- "evaluation of non-collegiate sponsored training;
- use of standardised tests;
- assessment of individual portfolios of prior learning"(p30).

Non-collegiate sponsored training is offered by such organisations as industry, business, government agencies and so on. Recognition of these courses allows the participants to translate their participation into credits in a university course. Academic credit being assessed on the amount of training involved and the levels of complexity of the learning required (Miller and Dalog, 1989).

Testing Program is generally normed against traditional college populations giving adults the opportunity to measure their learning in a standardised format to ensure acceptance of the assessment.

The Portfolio on the other hand is an instrument devised to assess the "true" experiential learning where no educational objectives exist to act as a benchmark by which verification can occur, in regard to the scope, experience and quality of the learning that has taken place.

Knapp and Gardiner (1981) suggests that an "Eight-stage model of portfolio assessment" be used, namely:

- facilitating re-entry and educational planning;
- locating and inventorying prior learning experience
- sorting and clarifying prior learning outcomes
- describing prior learning;
- documenting prior learning;
- demonstrating the prior learning; evaluating the prior learning;
- recording and interpreting the prior learning outcomes.

The British Experience

The National Council for Vocational Qualifications is attempting to "speed-up" the use of prior learning achievement credit via various aspects of the NCVQ model, i.e.:

- individual competences with their own performance criteria and standards; competences broken down into separate elements;
- specified standards, irrespective of how, where or when they are achieved.(Tudor,1991.p.193)

This initiative is being taken forward in higher education through the Council for National Awards (CNAA).

The Assessment of Prior Experiential Learning (APEL) program is part of the Credit Accumulation and Transfer scheme (CATS) (Tudor, 1991).

To actually determine educational outcomes from any process of learning in order that they can be assessed, it is first necessary to formulate them. This is often problematic and protracted.

Several colleges have established courses that help "clients" do just this. The Goldsmiths College and Thames Polytechnic course, started jointly in 1982, was called "Making Experience Count" (MEC). Both institutions offered MEC courses separately and the courses last for 33 weeks, one-day a week for two hours.

This allowed adults to look at their experience systematically in order to help them build confidence and make a more informed choice as to their next course of action.

Other institutions offering similar MEC type courses included Hackney College, Vauxhall College, Hillcroft College, Sheffield Polytechnic, Herriot-Watt University and Middlesex Polytechnic.

Not all the courses offered were concerned with (largely) unqualified men and women seeking access to Further Higher Education (FHE). Hillcroft, a residential college for

Further Higher Education (FHE). Hillcroft, a residential college for mature women, used experiential learning as a method of helping the students to plan for the future, in conjunction with their course preparation work.

Sheffield Polytechnic devised its course, in conjunction with the National Coal Board. Its students were non-graduate managers in full-time employment using their working experience towards the attainment of business and management awards. Here Sheffield was benefiting both employers and employees.

Herriott-Watt is different again. They provide courses for experienced and qualified civil engineers, mainly seeking chartered engineer status. The course is designed to allow individuals to diagnose their learning needs for further professional development.

Middlesex Polytechnic uses experiential learning to award credit retrospectively for mature students on degree-level courses, mainly those already in Dip.HE. and Combined Studies Degrees.

One local educational authority devised a Portfolio Preparation program, which helped adults from the inner-city areas, utilise their work and life experiences as a means of entering further higher education (FHE) and/or training for employment.

The American Experience

In the United States, a similar approach has been adopted although it tends to be more College based credit rather than a national system as in Britain with the NCVQs and CATS. The following examples highlight the methodology adopted by various colleges.

Thomas A. Edison State College asks students to devise a portfolio identifying and stating their Prior Learning experiences and providing supporting evidence.

To assist the student, portfolio workshops are used in which a personal resume is written, an account of prior college learning is given, finishing with a "succinct statement of learning supported by a narrative" (Tudor, 1991 p.192).

As well as the workshops, academic counselling is provided.

Empire State College students present evidence using an 'area essay' which corresponds with one of the broad study areas available, such as the arts, cultural or educational studies. The students are allocated mentors to work with them towards their degree programs.

The University of Maryland allows up to thirty credits for experiential learning. Preparation of the portfolio counts for three credits. The presentation contains course titles, relevant descriptive terminology and experience has to be substantiated via an "ability to apply skills and knowledge gained in one context, to another" (Tudor,1991.p.193). The college gives credit where the prior learning corresponds to the course curriculum.

The State University of New York, Brockport takes yet another approach. Again the evidence has to match with what is taught in the college. However, students use Bloom's taxonomy to "extract the affective, cognitive and psycho-motor learning acquired from the experiences" (Tudor,1991 p.193). Tutors assist the student in the gathering of evidence.

Ohio University, 309 students have enrolled in the Experiential Learning Program since its inception in 1978.

Students in the program enrol in a four hour course entitled Portfolio Development during which they prepare a dossier of learning and documentation that is matched with courses at the university. The faculty awards credit where a student's learning matches the anticipated learning outcomes of the courses.

The Australian Experience

The Australian process consists of two phases with accessibility to a third phase. The first phase, the submission of application, places the onus on the student to judge which of his/her experiences and learning are relevant to the areas in which he/she is seeking recognition. The second phase consists of an interview. Those present are the course expert, an RPL representative and the student. The students may have a support person present, and this could be anyone the students feel may be of help in presenting their case. It is at this stage that further clarification is made as regards to the appropriate ness of RPL to the particular student. It is also at this stage that the decision will be made whether to grant recognition, deny recognition or whether further assessment is required. Further assessment leads to the third phase and the decision made at this stage will be final (Broadmeadows College of Tafe, 1992, pp. 15-16).

It must be noted that most of the projects described in Britain, the USA and Australia appear to be limited in scope. Most seem to be localised in a small number of institutions of higher education or TAFE Colleges as well as in a selected number of faculties and/or courses. This too has been the case in the Australian experience; for example in Deakin University, RPL has been pioneered in, and largely limited to, the Technology Management course. This course has actually emphasised flexible learning systems, particularly a work-based model. The tendency has been to measure supervised learning achievements rather than "purely" experiential learning outcomes.

Institutional And Equity Issues Associated With R.P.L.

Quality of the Learning being assessed?

This question is of major concern in the case of recognition of prior learning and consequently, translates into barriers being erected by the major gatekeepers of the universities, the individual subject "experts". It appears that the concept of learning outcomes being distinguished from inputs is highly controversial.

The "experts" have been accustomed to an educational "input" model where an authority, external to the University, has determined the quality of the entrant. Although the evidence of the quality of intake has not always been reliable (Bosworth, 1991) it nevertheless has provided a benchmark that is seen as necessary to produce a quality graduate. With the absence of this entry benchmark, the "expert" has to be responsible for setting the educational outcome levels of a quality graduate. What this means in real terms is that in order to assess prior learning, the "expert" has to be aware of what affective, cognitive and psycho-motor objectives are to be exhibited in a successful graduate at the conclusion of a course. This requires that courses be measured through a criterion referenced mechanism with clear learning objectives being set. Many argue that this is possible in a

TAFE type course where training is the key word, but is not possible in a university course because the key word is "education" not "training".

"Many educators also sense a certain logical disjunction, in denying that adults have learnt something outside the institution yet they are unable to resolve the troublesome questions:

- who was responsible for the instruction?
- what and how much has really been learned?" (Miller & Daloz,1989 p.31).

This control is "normally" exercised by faculty experts whose perceived expertise to do so, is measured by their degrees, publication and so on. As well as through the design of the curriculum by these same faculty experts. An example of this problem is evident in the "Vermont State College's Assessment Program where a student earned credit because of knowledge of geography gained through his travelling experience as a seaman". Another student gained credit for a book he published on the carving of decoy ducks (Miller & Daloz,1989).

If these two students had been assessed according to the tasks specific to the particular subjects or work performed, then it would be conceivable that no credit would have been awarded. However, in both these cases, if the learning outcomes are examined, then the awarding of credits becomes totally understandable. For example, the amount of learning that was accomplished and the level of that accomplishment in the writing and publishing of a book, is self evident.

The major problems exist in the identification of who was responsible for providing the instruction for these two students? How did they know what to learn? What rigour was present in their learning experience? How did what they learned fit into the system? What performance level did they reach?

These questions can, in fact, only be answered once the institutional experts acknowledge the belief that learning can and does occur outside formal educational settings and that the problem does not lie in the learning but in the formal acknowledgement of that learning. Therefore the very first step in any acceptance of prior learning is the acceptance, that learning does and will continue to occur outside of the control of any formal curriculum or any "expert".

The next step is to turn this experiential learning into a form in which it is able to be acknowledged and accepted by the educational community. This could be achieved through a testing instrument with inbuilt reliability and validity. However, it is suggested by Deutscher (1970) that this leads nowhere. That in fact, "the basic assumptions that forming descriptions into similar boxes with similar titles would guarantee consistency is correct only in that consistency of titles was achieved. What is inside these boxes remain as different from the labels as the people from when the descriptions are devised" (Miller & Daloz. 1989 p.32)

Klemp (1977) argues that to use a model of self-assessment against a set of criteria derived from a work-based model is a far superior way of focussing on learning outcomes and achieving rigour in the assessment model. As a result the focus remains in the crucial process; that is the ability to organise complex information, to understand different sides of a controversial issue, to learn effectively from experience, to empathise, to take modest risks and to set realistic goals

and so forth, rather than on the content generally associated with a vocation.

Therefore, if educational outcomes for each course are established and tested against a set of criteria and that built into this set of criteria are higher levels of thinking, then benchmarks will be formulated against which experiential learning achievements can be measured (Miller & Daloz).

Equity Issues

The next issue is the translation of the experiential learning achievements into the necessary educational language. This is much more likely to be achieved through a task analysis in the workplace. Where a recognised workplace does not exist then this becomes extremely problematic.

The inadequacies of existing measurement techniques become glaringly apparent when attempting to assess adult women's prior learning.

Colleges/universities are more willing to accept prior learning experience acquired through paid work but unwilling, often because of set sterotypes, to award academic credit for women's learning from their unpaid work in the home, voluntary organisations and community work.

This is generally the result of lack of information about women's unpaid work in respect to the knowledge skills and abilities necessary and the incidental learning acquired.

Ekstrom (1982) stated that from her research, she was able to categorise unpaid work into clerical tasks; administrative work; communications; and problem solving. These "I can" lists were suggested as a way of identifying the skills women acquire through unpaid work. In another study, Neely and Schulz (1980) had eight women educators who were seeking administrative positions use selected "I can" lists to develop portfolios showing the relevance of their unpaid work experience. These portfolios were evaluated by 24 administrators. The study concluded that portfolios of this type are a valid and reliable way of presenting skills that employers might otherwise overlook.

In a further study, Ekstrom wanted to evaluate the importance of the skills, identified by the "I can" lists, with employers and educators. From this work, she devised the "Have skills" chart as a guidance tool to assist women, counsellors and employers in correcting the relationship between women's unpaid work experience with paid employment.

The results suggested that adult women with unpaid work experience and skills, in office and clerical work, administration and management, communications and public relations, problem solving, financial management and sales, counselling and interpersonal skills, would have relatively little difficulty transferring their unpaid work experience to the paid work force.

The "Have Skills" material does not, however, answer the most difficult question in assessing women's prior learning; that is —

"Is this individual's prior experiential learning relevant for this specific job or for this particular educational program?" (Ekstrom 1981) tried to deal with these questions in the research study, Project Access:

- the researchers drew up lists of the functional, work specific and self management skills, needed in the ten occupations and ten areas of vocational education that were the focus of the study;

- small samples of employers rated these skills as to their importance in selecting new workers;
- vocational educators were asked to make the ratings based on the usefulness of the skills in determining course exemption or advanced placement in the program;
- the most important skills for each occupation who had the program were then compiled into new scales which are part of an instrument called the Experience Description Summary.

For further work using the Experience Description Summary, this self-reporting instrument was used as part of a counselling program for 155 women who were considering a return to the labour force. Six months later the employers of the forty-nine women who had obtained paid jobs, were contacted.

The employers made a global evaluation of the women's job performance, rating them on the skills that were included in the Experience Description Summary. The global ratings showed that 69% of these women were considered above average employees and that none was considered to be a below average employee. The women tended, in general, to undervalue their own skills in comparison with their employer's ratings.

The recognition of women's unpaid work in the form of credit towards a university degree could have a significant equity impact. For decades women have strived towards having their unpaid work recognised and at last there is a means by which this can be achieved. This is a very important landmark in women's careers as no longer will their time spent in the home and in volunteer work be dismissed, resulting in them being forced to restart their careers from square one. Incidental learning will not only be acknowledged but will be "measured" and therefore could be utilised to further, rather than "hinder" their future careers.

Financial constraints of prior learning recognition

At many institutions, according to MacTaggart and Knapp (1981) "the impetus to develop experiential learning programs came from educational reforms with all too little concern for the effects on the bottom line" (p.34).

In developing an assessment model for RPL it is necessary to take into account both the capital and operating costs of such a program. Capital costs include the hidden costs of the assessors involved, for example are they being paid for their direct or indirect contribution or is it in fact part of their "normal" duties.

Operational expenses, include the number of students being assessed; the process of the assessment and measures being taken to ensure quality control. For example, MacTaggart and Knapp (1981) argue that "large programs that are not initially self-supporting will place a greater burden on institutional budgets then similar smaller programs"(p.34). However, they suggest that the real answer is "thinking big, anticipating demand, and marketing the program by using pro-active techniques in conjunction with sound financial planning" (p.36). This will place an embryonic program on a more solid footing than starting small with significant expenses a major

consideration in these days of economic crises in higher education.

From their research work MacTaggart amd Knapp (1981) endorsed the idea of payment for assessors believing that payment often indicated an increase in the quality of assessments. Further, they suggested that capital costs should be met from external sources but that operating funds be derived from the student in terms of fees for service. This carries an important equity issue — if fee for service is charged would this exclude all but the students being sponsored by their employer. If so, this is likely to exclude many women where experential learning has occurred within the home. What if students undergo an assessment and do not receive any credits, do they pay any fee? On the other hand, is paying a service fee and receiving credit synonymous with buying a degree?

Alternatively, should the large amount of time and organisation required to provide any form of assessment of prior learning achievements be underwritten by the university in the sense of being a "loss leader". The complex model of portfolio assessment suggested by MacTaggart and Knapp (1981) (Fig 1) would indicate a considerable time commitment by faculty/expert staff in which case it would limit the amount of time in which any one university could sustain a program, without either large amounts of external funding, or a substantial service fee being charged to the students.

Possible Assessment Model

The possible assessment model suggested, is based on the literature surveyed to date, this would appear to indicate that it is necessary to view the assessment model in a number of clear and distinct steps.

1. The gathering of evidence and the formulation of learning outcomes.

Where intentional learning has occured this is a simple task, as clear parameters and aupporting evidence exists. The difficulty lies in the collecting of evidence to support incidental learning. It is in this latter case that production of a portfolio becomes important not only as evidence but in the development of the learner's own metacognition (Knapp & Gardiner, 1981). It is at this point that the Universities in Australia could play an important role, as they do both in Great Britain and America, by offering portfolio courses. These courses would assist the learner not only to gather the relevant evidence but to extricate the learning achievements from this evidence.

2. The evaluation of the experiential learning achievements.

As in the gathering of the evidence, the major problem exists in the evaluation of the learning outcomes achieved through incidental learning or when intentional learning is unsupervised. As stated by Knapp and Gardiner (1981), "Many faculty members feared that students would be awarded college credit just for living"(p8). This evaluation could take many forms; a completed portfolio, that is when the distillation of "raw life experiences" (Knapp & Gardiner, 1981,p.9) into learning outcomes has occurred; "interviews; simulations; performance tests; and product assessments" (Knapp & Gardiner, 1981,p.9). The major consideration should be that the evaluation occurs,

against a set of criteria, separate from the specific course. As Knapp & Gardiner (1981) state, "Learning should be related to an academic field but need not be confined to existing course content" (p17). What is being done through this model is that, the evaluation of a student's learning achievements as distinct from the possible artificial matching of a students learning achievement to a course content. In this way the evaluation of learning achievements will have built in quality control because it will not be susceptible to the vagaries of whether or not the student load has been met in any one faculty or course.

3. *The centre for evaluation of prior learning achievements.*

This centre could be established either as central office within the university, or as is the case in Great Britain (Tudor,1991) and some places in America (Tudor,1991), as a central assessing agency to evaluate students' prior learning achievements. It would be expected that subject "experts" would be employed as the evaluators. These evaluators would be paid, therefore eliminating the problem associated with "volunteer" staff. Through the establishment of a centralised infrastructure and the possibility of an increased student load, the centre would minimise the cost involved and make a fee for service charge more realistic.

As Knapp & Gardiner (1981) state that"more and more institutions are taking over the brokering function by cooperating with other institutions..." (p.14). They felt that this was particularly important with the use of technology - "Assessment centres, institutional or regional, will be a wise way to share the cost and logistical burden of technology across departments and institutions as well as the benefits in the form of learners who are guided to the programs as well as the benefits in the form of learner.." (p.15-16) who are guided to the programs that are most suitable.

The added feature of this model is that the students' have their "own" experiential learning evaluated and credits would be granted in an academic field rather than by course content, therefore having the advantage of portability. The credits granted to a student would be seen as having the same quality as credit gained through conventional ways and therefore would have the same possibility of being accepted by other universities.

4. *Matching the evaluation of prior learning to courses*

This would be the final step in the proposed assessment model. The students having had their experiential learning achievements evaluated would then proceed to the relevent faculty to have their credits as sessed against the course content for their chosen subject. This step would then be reasonably cost and time effective.

In Conclusion

Whatever model of assessment is adopted by universities in Australia it will certainly necessitate a change to the very philosophical foundations that underpin most of the universities.

Courses will have to be modulised in order that prior learning credit may be given for parts of the course as well as the course as a whole. Learning objectives will have to be clearly stated as well as having definite performance criteria against which experential learning credits could be

assessed. In turn, this will necessitate general acknowledgement and acceptance of the level and quality of learning achievement outside of a formal institution. As well as the recognition "of the peculiar needs and contributions of the adult learner in, the recognition of, the distinction between androgogy – the teaching of adults and pedagogy – the teaching of children (Kelly 1979 p 21).

However, one thing is certain, Recognition of Prior Learning is an exciting concept for everyone and in particular for women and is far too important to the future of tertiary education not to be taken seriously. Australian institutions should build on the experiences in other countries in constructing an RPL assessment model which is both cost and equity effective.

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A POTPOURRI OF INSTITUTIONAL RESEARCH ISSUES IN A PLANNING ENVIRONMENT

Dr. Jim Tognolini
Director of the Institutional Research Unit (formerly)
and
Robert McCormack, University Statistician
University of Western Australia

Introduction

The need for institutional research in Australian tertiary institutions appears to be expanding. It is spurred on by the increased demands for institutional accountability and assessment, coupled with developments in planning and policy analysis, in a climate of diminishing resources.

It is in this context that we thought it might be interesting, and timely, to prepare a paper to consider some of the practical issues confronted by an institutional research unit which is centrally involved in a university's integrated strategic planning and budgeting processes. In this presentation we will discuss issues such as role identity and the plight of institutional researchers, location in the organisational hierarchy, proliferation of functions and tasks and communication of results (this is closely linked with having an impact). Examples taken from specific projects currently being undertaken by the Institutional Research Unit will be used to illustrate the issues and, where applicable, we will discuss a number of the strategies we have used in an attempt to address them.

I would hope that members of the audience can relate to the types of issues discussed and perhaps the question session could be one in which we can compare experiences and share possible solutions.

Before launching into the issues section of the paper it would seem appropriate to give some background to the Institutional Research Unit (IRU) of The University of Western Australia.

The Institutional Research Unit

The Institutional Research Unit (IRU) evolved from the Research Unit in University Education (RUUE) during 1989. The latter Unit was an academic unit responsible to the Deputy Vice Chancellor (Academic) for conducting research into academic issues of interest to the University. For example, RUUE produced numerous reports dealing with the predictive validity of Tertiary Entrance Examinations (TEE), the characteristics of entry cohorts and the academic progress of undergraduate students. In addition, the Unit conducted course experience evaluations and was responsible for co-ordinating and analysing the student evaluation questionnaires.

The Institutional Research Unit (IRU) was created in 1989 and located in the Planning Services Section of the Registrar's Office. In addition to IRU, Planning Services includes the Statistics Office and the Equity Office and it is

functionally responsible to the Registrar. It has a close working relationship with the Academic Secretariat, the Section that services the major committees of the University.

The primary function of Planning Services is to provide management information to the major decision makers within the University. The Statistics Office is primarily responsible for the preparation of statistical data (including DEET collection), projections (including the Educational Profile tables and budget projections), the preparation of statistics for regular publications and ad hoc information requests. Correcting data, as well as, creating data in a format that is suitable for the analyses undertaken is another responsibility. The IRU is responsible for providing research-based management information to its clients who include the University's executive (Vice-Chancellory, Divisional Heads, Deans, Registrar and the Vice-Principal) and its major decision-making Committees, particularly the Planning and Resources Committee. The Statistics Office frequently provides the data for the research projects undertaken by IRU, and there is a close working relationship between the two Units.

It can be seen that IRU has a much more service-oriented role than its predecessor. This is reflected in the types of projects it has been involved in over the last few years. For example, the Unit has

- played a major part in developing, refining and implementing a formula-based resource allocation model for use within the University;
- co-ordinated the development of a strategic plan for the Central Administration, and has been heavily involved in the preparation of the University's strategic plan;
- been responsible for the development of performance indicators (e.g. completion rates, indicators of research attainment, indicators of teaching quality);
- co-ordinated and prepared University submissions to DEET discipline reviews, the Higher Education Council's quality initiatives, the competency thrusts of Finn, Mayer and Carmichael and, the credit transfer developments initiated by DEET and the Australian Vice-Chancellor's Committee (AVCC); and,
- conducted research projects on areas of interest to the University e.g. developing a workload index for Faculty Administrative Officers, evaluating the University's A-index exercise for measuring the research attainment of departments and, developing an index for socio-economic disadvantage.

This change in orientation is understandable given the contextual changes that have taken place in the tertiary sector over the past decade. Not long ago the major issues confronting universities were primarily academic in nature. In those days resources were adequate. Some may even say plentiful, and there was minimal pressure on the tertiary selection system, as the unmet demand was supplemented by a responsive employment market. The main issues were primarily educationally motivated and debate at committee meetings would have centred upon types of courses, the nature of objectives and specific objectives, and students may

even have been mentioned on occasion. The focus has changed. The terms that have the most currency these days would include performance indicators, outcome statements, resources, quality, benchmarks, resources, competencies, assessment, resources, management, strategic planning, resources, clients, products, resources.

The environment in which universities operate has changed and universities have had to adapt their management systems to cope with the change. The IRU of The University of Western Australia (UWA) is a product of this change.

With that as background, I now intend to identify what I see as some of the key issues confronted by the IRU since its inception. I will also indicate how the Unit has addressed the issues and I hope that members of the audience who have faced similar issues/problems might contribute suggestions as to how they have confronted these in their own institutions.

Institutional Research and Planning Issues

For the purposes of this paper, I have grouped the issues under four main headings, role identity and the plight of institutional researchers, location in the organisational hierarchy, proliferation of functions and tasks, and communication of results.

(a) Role Identity and the Plight of Institutional Researchers

What exactly is institutional research and why do we do it? Middaugh (1990) in a paper in which he examines the scope and nature of institutional research offers the following definition.

Institutional research is the sum total of all activities directed at empirically describing the full spectrum of functions (educational, administrative, and support) at a college or university. Institutional research activities examine those of both internal and external environments, embrace data collection and analytical strategies in support of decision making at the institution.(Middaugh, 1990, page 36).

The breadth of the role as described in the definition creates a personal dilemma for most institutional researchers because of dichotomy between the routine tasks that most institutions require of them and the kinds of analyses they find stimulating and personally rewarding. For example, the heavy demands made on IRU for routine reporting to internal and external audiences (the institutional role), means that there is little, if any, time to conduct the challenging, problem-focussed analyses that attracted members of the Unit to the area in the first place. IRU, like most institutional research units, is relatively small (4.5 FTE staff) and, as the demands for good quality management information escalate, so the problem is exacerbated.

One way that the Unit has tried to redress this problem is by establishing working teams drawn from across the University. For example, one of the research questions the Unit is currently addressing is, "Do students from rural schools perform better or worse than students of commensurate ability from metropolitan schools after entering The University of Western Australia?". The question is motivated by the hypothesis that if students from rural schools are disadvantaged with regard to their TE Score (as suggested

by an exploratory analysis), then they might be expected to perform appreciably better, once they have entered the University, than metropolitan students with equivalent TE Scores. If the hypothesis is confirmed then there might be grounds for including some compensation mechanism into the tertiary entrance procedures, for students from rural schools (this illustrates the political and institutional perspective).

While the results from this study are particularly interesting, I do not intend to dwell on the project at this time. The important point with regard to the issue that has been identified, is that the Unit has established a project team to conduct the research. The team consists of the Director of the IRU, a Professor of Education (interested in the measurement and educational dimensions of the problem), a Professor of Mathematics (interested in the modelling dimensions), and the Chairman of the Academic Board (the political dimension). The staff of IRU complement the project team with a mix of quantitative and qualitative skills. This team provides a pool of expertise and resource that allows the challenging and 'pure research' components of a politically motivated question to be developed much further than would be the case if IRU had to tackle the question within the confines of its own resources. The IRU provides the data for the study, and prepares the reports that will be of interest to the institution. At the same time the members of the Unit are getting the chance to address some of the more challenging research questions and, just as importantly, they get the opportunity to publish (as co-authors) in research journals.

This latter point is very important because institutional researchers require career paths. As indicated earlier, institutional research units are generally small organisational units and, at least in the UWA case, the staff are located in a non-academic area and employed under the general staff award. There is no direct career path for such staff as they generally have an academic background and do not have the background of the 'typical' administrator. A large component of an institutional researcher's time is spent in meetings and responding to the problem-oriented requests of decision makers. This means that their research productivity decreases and the promotional prospects within the academic hierarchy are consequently limited. Institutional research has the potential to be a backwater within tertiary institutions and career-oriented staff cannot afford to spend lengthy periods of time within the area.

(b) Location in the Organisational Hierarchy

A second, but closely related set of issues pertains to the appropriate location of the institutional research unit within the organisational structure. The workload of an institutional research unit is largely influenced by its location in the organisational hierarchy as well as by the expertise of its staff. IRU's research agenda is largely shaped by its position within Planning Services. For example, it commits significant resources to supporting the strategic planning initiatives of the University.

There are a number of advantages in having IRU so closely aligned with planning and having the Unit placed high enough in the organisational structure for the staff to be aware of the major issues facing the

decision makers. Firstly, the Unit has direct access to the University's major decision-making committees. This means that it can monitor issues of potential interest to the committees and be proactive in providing information that might be used in formulating a University position.

A disadvantage of being so closely involved in the planning process is that the Unit has had to relinquish some of the academic initiatives that used to be performed by its predecessor, the Research Unit in University Education (RUUE). The Unit is no longer involved in academic staff development (other than the Director being on the Academic Staff Development Committee), nor does it conduct the student evaluation of teaching exercise. These tasks have now been assumed by Personnel Services through its Professional and Career Development Unit. The nature of IRU projects have changed quite appreciably.

A second advantage of being located in the Registrar's Office is that the Unit is afforded the protection of being a member of a large resourcing unit. This is particularly important in times of financial constraint. Prior being located in the Registrar's Office, IRU was attached to the Vice-Chancellory as a small independent academic unit. It would be accurate to say that with the budget cuts that are now being imposed on the University, IRU would have been one of the first casualties. It isn't that the work produced by the Unit was not valued. Rather, it was that its functions were not perceived as essential because of the tenuous link to the University's primary functions of teaching and research.

A third advantage is that the Unit now has direct access to the University's data and information sharing networks. A few years ago if the Unit requested data for some particular study, the turn-around time was something like 3-6 months. Now, with the Unit firmly imbedded within the Central Administration, working relationships with other Sections have been strengthened to such an extent that the turn-around time for similar requests is at most 2-3 days. For example, the IRU has gained better access to the considerable expertise of the Statistics Office staff, as well as access to existing programs and data sets. This has reduced the amount of duplicated effort that previously took place. In addition, staff from the other Sections within Central Administration participate on working parties. This not only improves access to data, but also helps to break down some of the insularity that is sometimes evident within fixed organisational structures.

One disadvantage of the location has been referred to earlier. That is, there is no logical career path for institutional research staff. A second disadvantage is that the Unit is viewed as being part of the Central Administration by the wider university community. If an 'us versus them' mentality exists (between the academic organisational units and the Central Administration), as it does in most universities, then the relationship between the institutional research unit and the academic community might be adversely affected.

When IRU was first established the Director resisted the temptation to immediately relocate the Unit from its home in office space contiguous with an academic department, to the Central Administration. It was felt that the Unit needed time to establish its bona fides (credibility) and this was better done away from the Central Administration.

The Institutional Research Unit is now firmly located in the Central

Administration building and has a degree of credibility within the academic community that is fairly impervious to its location.

(c) Proliferation of Functions and Tasks

One of the most difficult issues facing the IRU and I would suggest most small institutional research units is the issue associated with increasing work load. Just about every task undertaken by institutional research units leads to further work, either by replication for time series type analyses or by involvement in the implementation of more sophisticated (and politically oriented) types of projects. In addition, if a unit shows that it is capable of producing top quality products then this produces a market of its own and the demands for new projects will undoubtedly increase, probably exponentially. I would like to demonstrate this particular issue by reference to two projects undertaken by the IRU. The first involves the formulation of a resource allocation model for the University. In 1990, the IRU was asked to develop a formula funding model, along the lines of DEET's 'Relative Funding Model', which could be used to distribute funds to the University's divisions (the major resourcing units within the University). The IRU responded by constructing a model

- the underlying philosophy of which was that it was consistent with the University's mission and driven by the University's strategic plans;
- which distributed the major portion of DEET income by a formula and a lesser proportion (a discretionary proportion) by competitive allocation, in accordance with the University's strategic plan;
- which comprised a teaching-related component based on student load, and a research-related component calculated predominantly on a competitive index, which rewarded research effort and attainment;
- based on planned student load for the year, with a mechanism built in for some marginal adjustments if there were significant differences between planned and actual load;
- which allocated resources at the level of the divisions, with divisions being able to distribute resources internally between departments according to their own requirements; and,
- which phased in the transition to new funding levels over a triennial period via adjustments negotiated with divisions.

Ideally once the model has been developed the IRU should be able to pass over the implementation of the resourcing model to the Accounting Section, which is responsible for the budget, and then take on another project. However, in practice, for one reason or another, this has not happened. One of the reasons is that the model is quite sophisticated (it has, for example, an iterative procedure for adjusting weights, and includes a recursive filter for ensuring that the differences incurred by any division in moving to the funding levels, are dampened, and requires a conceptual understanding of the modelling process. This means that there are a myriad of detailed questions being asked by the resourcing units as they come to terms with the outcomes of the model. The perception is that these

questions are best handled by the developers of the model. Currently, a significant (approximately 35%) proportion of the Director of IRU's time is spent either answering specific questions regarding the model, refining or extending the model, or assisting divisions in developing their own allocation procedures for distributing the funding model to departments.

The second example used to demonstrate how specific research projects can lead to a proliferation of functions and tasks is taken from the area of strategic planning. As universities become more adept at planning within a financially constrained environment, so the need for good quality information on which to base decisions becomes paramount, and the demands on the management information sections increase. This has already been felt at one level where DEET have required more and more management information of universities. However, it has now permeated down to sub-units within the university, as decision-makers are having to make difficult planning decisions. For instance, questions are being asked, such as

- is the mix of non-academic to academic staff (at the overall university, divisional and departmental levels) appropriate?;
- are the student/staff ratios for the different disciplines (departments) comparable with similar disciplines from like universities?;
- how do students from rural schools (or TAFE or socio-economically disadvantaged backgrounds) perform once they enter university?;
- how has the University (division/department) performed relative to its nominated strategic objectives for the current year?

These and a multitude of other questions form the basis for IRU's research agenda. One of the critical problems associated with a proliferation of tasks, without a related increase in resources, is that the quality of output is likely to suffer, or the turn-around time may be extended to such an extent that the information will arrive too late to impact on the decision.

A second problem is related to the quality of the data. While there is a large volume of data stored on the University's mainframe computing system, the focus of these systems is to meet the day-to-day operational needs of the administrative sections that use them; e.g. the Human Resource System is primarily a payroll system. As such it is often difficult to obtain data suitable for research projects. A substantial proportion of staff time in the Statistics Office and IRU is expended on validating and correcting data.

In order for IRU to maintain its credibility it must commit the majority of its resources to the bread-and-butter activities of institutional research – data collection, preparation, analysis and reporting. These activities then must form the base upon which the second-order studies – policy analysis, assessment and planning are built.

In an attempt to meet the demands for management information, IRU has embarked on a project aimed at creating and formatively evaluating an Executive Information System (EIS, linked to a database of performance measures or indicators of quality which can be used to maintain and enhance quality management in the University. In essence the purpose of the system is to take relevant data, as defined by the

performance indicators imbedded within the University's strategic plan, and integrate them into a secondary data base that is for query purposes only. The user interface to this proposed system will be simple to use and yet provide the detailed information required by different levels of users; i.e. it should meet the needs of the vice-chancellory as well as heads of departments. It is anticipated that once this system has been developed and implemented it will help minimise demand on IRU's resources. It is recognised that such a management system has the potential to be the key to the future of quality management in the University, its eventual success hinges upon the commitment from the leaders in the institution.

It is worthwhile stressing at this stage that most of the questions identified above require both cross-temporal and cross-institutional analyses to be useful use in a planning context. My guess is that most institutions are probably like UWA in that they can generate time series studies with reasonable ease. However, obtaining comparable data at a disaggregated level (say the level of department) is practically impossible to obtain. Most of the data available from DEET and the AVCC are at too broad a level (e.g. AOU-group) to be of use for planning within an institution. Recently in response to a question on the appropriateness ratio of non-academic to academic staff within departments, we sought comparable information from seven other institutions. The response (which just required the transfer of 4 files already prepared for DEET) was less than satisfactory. Only 3 of the 7 institutions forwarded the data. While recognising the limitations of the DEET data collections, access to the DEET files via AARNET, as well as data aggregated to AOU (Dept) level would facilitate cross-institutional analyses. Furthermore, I would hope that in the near future databases of the type envisaged in the EIS will be networked nationally so that cross-institutional comparisons, where appropriate, will be able to be conducted. In the interim we would be very happy to negotiate with institutions with like missions who might be interested in establishing a data-exchange network. The final set of issues we have grouped under the heading 'communication of results'. We can openly admit that most of our time is spent worrying over how to ensure that the recommendations and suggestions contained in our reports at least get due consideration by the appropriate audiences.

(d) Communication of Results

Ridge (1978) argues that the main role of institutional research officers is to provide top-quality management information to key internal and external decision makers. While this definition, and the one advanced earlier in this paper, focus on the central purpose of institutional research, Dressel (1972) reminds us that the institutional researcher's "ultimate success depends less on the research findings and more on the promotion of action..." (page 49). The long term success of an institutional research unit depends on its ability to communicate the results of its research to the community and to provide support and encouragement to decision makers to accommodate the recommendations contained in the report.

Most of us can recall occasions when decision makers have ignored volumes of data and pages of text and graphs. As Norris (1983) says the "finest work of analysis imaginable can

be rendered ineffective if it is not presented thoughtfully and in a manner congruent with the needs and preferences of decision makers" (page 168).

IRU has produced cohort analyses for each of the courses controlled by the University's 10 faculties. These studies track each student through his/her course and contains a wealth of information that could benefit the quality of the teaching and learning experiences of the students in the program. What tends to happen with these reports is the faculty peruse the document, rationalise the results, say thank you very much and then file the report away in anticipation of next year's update. Very rarely do faculties seek further information regarding some particular statistic or aspect identified in the study e.g. a high withdrawal rate or major fluctuations in yearly pass rates.

The major problem with these studies is that the faculties have not been convinced that they have a problem to which they need to know the answer. The reports that have most impact are those that are either initiated by the faculty or other decision making body (e.g. major committee or senior executive), or are related to structural or resource changes. The report that has been mostly widely read and had the greatest impact is the one giving details of the possible funding models to be adopted by the University. Another report that will undoubtedly be widely examined and engender much debate is the, "Review of Devolution". This report contains some suggested structural changes for the devolved University, including some suggested changes to the nature of faculties.

I must admit that one of the most challenging experiences faced by the Unit is how to integrate the work of IRU into the fabric of the University. Billups and De Lucia (1991) have suggested a number of practical and achievable strategies for improving the communication of results. The importance of each strategy may vary from university to university, but the ones that are most applicable to IRU, and consequently the ones we at The University of Western Australia are trying to develop would be:

(i) know the culture of the university. Politics, group dynamics, staff and faculty relationships and the history and traditions of a university create a unique institutional personality that pervades the actions and interaction of all members of the university community. Institutional researchers must attend to those patterns of communication, the politics and the behaviours and values accepted in the organisation, when considering the kinds of information to produce and how to present the material;

(ii) know the institution's decision-making process. Knowing the decision makers and being aware of how they believe they make decisions is crucial. Another important aspect of this strategy is to work within the institution to establish mechanisms for acting upon recommendations and for providing feedback to key committees and decision-makers. What has become of the recommendations contained in DEET's highly proclaimed discipline reviews?;

(iii) know the question. A most frustrating problem for institutional researchers exists when the decision makers constantly change the formulation of their question. It is critical that the institutional researcher has direct access to the decision maker asking the question, that the question be clarified from the start and that this

process continue through the life of the project;

(iv) develop good presentation skills. Effective presentation is a key ingredient to good communication and in having an impact. While there are a number of suggestions for producing a good report, the main one from my experience would be to have a well structured executive summary. Busy executives have minimal time to wade through pages of text and analyses, irrespective of the quality of the final report.

Conclusion

In a climate in which management practice and institutional accountability are the key themes of the 1990's, there is a continually growing demand for more comprehensive, timely and accurate data to support management decision making. Institutions can no longer move, with little self-knowledge, blindly into the future. This leads us to suggest that institutional research is in a development phase. However, most institutional research units are relatively small (and in my opinion they will not grow) and because of the nature of their work, the staff are extremely busy meeting the day-to-day demands of their constituencies. Very rarely do they get the opportunity to consider some of the issues which impinge on their operation and development.

Rather than talk about one or another of the research projects we are undertaking at this time, I have availed myself of the opportunity to articulate some of the issues that perhaps many other institutional researchers are facing. At the same time I would extend an invitation to all members present to feel at liberty to follow-up any of the projects alluded to in the text of the paper, add to the list of issues identified in this paper (my list is far from exhaustive) and suggest solutions to the issues that might make our job easier.

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Dr Jim Tognolini, Director of the Institutional Research Unit, The University of Western Australia. Mr Robert McCormack, University Statistician, The University of Western Australia.

LINKING EDUCATION, INDUSTRY AND THE COMMUNITY: A REGIONAL MODEL

Associate Professor Graham Mulroney
Acting Dean, Faculty of Applied Science
Royal Melbourne Institute of Technology Melbourne, Australia

Introduction

Over the period of the past five years, a group of regional networks has developed in the northern suburbs of Melbourne, Australia. Each network is a partnership with education, industry and community participation. Each network has a specific focus: one on industry training, one on technology transfer, another on enrichment of school education. However, although the objectives vary, each relies on the fundamental assumption that the objectives will be best achieved in partnership, by taking advantage of the full range of resources, human and physical, available in the region.

The Region

Diagram 1 shows the Melbourne metropolitan regional boundaries as defined by the Victorian Ministry for Planning and Environment. It needs to be noted, however, that people and groups are seldom as precise. The networks, and the members of the, exhibit varying perceptions and varying clarity of definition of "the northern region of Melbourne", "the northern suburbs of Melbourne" or " Melbourne's north". In any case, a region is always an essentially open system. Both regions and their interactions vary in space and time.

There is great diversity across the region. It contains about forty per cent of Melbourne's manufacturing industry base. The textile, clothing and footwear industry predominates. Other large companies include Kodak, Ericsson, Ford. Educational, training and research infrastructure is excellent with three university campuses, seven technical and further education (TAFE) campuses, the Division of Manufacturing Technology of the Commonwealth Scientific and Industrial Research Organisation and the Australian Electronic Development Centre. There are two "growth corridors" in the region where population increases are among the highest in Victoria. Melbourne Airport is on the western fringe of the region.

The Networks

(i) *Northern Interactive Education Coordinated Area Program (NIECAP)*[1,2]

In response to increasing concern about the participation rates in science, mathematics and technology

education, the State Government of Victoria established in 1987 a Working Group on Education for Science and Technology. The Report of the Working Group [3] concluded that the most effective strategy for increasing student participtiion was to coordinate, on a regional basis, a series of intervention strategies. Funding was allocated for the establishment of four Coordinated Area Programs (CAPs). Each is sited at a tertiary institution in a different region area of Victoria.

They are charged with linking schools, local industries, tertiary institutions, community members and others to develop strategies to improve the image held within the home, the school and the community concerning science, mathematics and technology and careers and employment in these areas, and strategies for improving transfer between and entrance to post secondary study. The CAPs concept has much in common with the local Alliances for Sciences in the US and the Science and Technology Region Organisations (SATROs) in the UK.

Evaluation report by consultants in 1989 have been published [4,5] concluding that "there is now a firm basis or organisation and goodwill from which CAPs program can affect a large number of students in schools, to influence their subject choices and, ultimately, their participation in teritary science/mathematics program"[5]. Two additional CAPs were found in 1990.

Northern Interactive Education Coordinated Area Program (NIECAP), one of the original CAPs established in 1987, is sited at the Bundoora campus of Royal Melbourne Institute of Technology (RMIT) in the northern metropolitan region of Melbourne. A steering Committee for NIECAP was established in 1988 with members from industry, the Ministry of Education, school support centres, Phillip Institute of Technology (now RMIT), the Northern Metropolitan College of Technical and Further Education, and a local municipal council. Links with local industries were strengthened further through the involvement of NIECAP members with the Northern Industry Education and Training Link Group (NIETL), a regional group concerned with developing strategies to meet the education and training needs of industry (see [ii] below). In 1989 the Committee was strengthened by members from La Trobe University.

In the beginning the major emphasis was on projects which made use of Phillip Institute of Technology's human and physical resources. These include:

* a Chemistry Enrichment Program [6,7] in which each year more than 500 year 12 students from 30 local schools spent a day in the Institute performing experiments on a range of modern chemical instruments;

* Computer Camps for Girls [1,2] in which year 10 and 11 girls take part in a week of wide-ranging computer based activities.

As increased links were developed, NIECAP's activities have expanded and broadened to include projects as:

- School-Industry Links program in which NIECAP works with companies and schools in the region to enable teachers and students to access information;
- School Work Program in which year 11 students spend one day per week in the workplace for a

period of thirteen weeks; credit is obtained for school studies;
- Teacher Release to Industry Program in which teachers are given time release to work in a company developing curriculum material; and
- Manufacturing Industry: Careers and Opportunities, a joint project with NIETL (see [ii] below) which aims to increase awareness and improve the perceptions of manufacturing industry by students, schools and the community.

(ii) Northern Industry Education and Training Link (NIETL)[8]

In October 1987 a Symposium was conducted at La Trobe University to consider opportunities for northern suburbs industries development and training emanating from strategies and policies of the current Victorian government. Subsequently the Northern Industry Education and Training Link (NIETL) was formed with representation from industry, education, and local and State government. NIETL aims to promote cooperation and coordination between and among industry and tertiary education institutions in the economic development of the northern suburbs, in order to:

- conduct seminars and conferences;
- assist the exchange of tertiary education teaching staff with industry based personnel;
- facilitate communications among industry and tertiary institutions employing various means including production of bi-monthly newsletters;
- construct education programs that will assist young people and people re-adjusting in employment to assess career prospects locally – especially in manufacturing areas;
- indicate to specific industries – especially in manufacturing – and specific tertiary institutions strengthsand opportunities to be developed and exploited;
- assist local industry access to government assistance programs;
- provide comment, advice and support for economic development being undertaken by local government based groups.

Specific activities have included:

- breakfast seminars on topics such as "Structural Efficiency ThroughTeamwork", "Implications of Government Policy for Technology, Education, Training and Business Organisations in the Northern Region","Tariffs and Protection";
- industry visits aimed to provide an opportunity for participants to benchmark their organisations in terms of best practice;
- production, in cooperation with La Trobe Technology Precinct (see [iii] below) of an Industry Resources Directory.

NIETL has high credibility and profile amongst industry in the region. As such it has become a very important

organisation for educational instructions.

(iii) La Trobe Technology Precinct

The Precinct core area consists of the La Trobe University, its on-campus Research and Development Park, a privately developed Research and Development Estate, Royal Melbourne Institute of Technology and four municipal councils. Its objectives include the facilitation of technology transfer, encouragement of joint research contacts and consultancies between universities and industries, and the development of technology based industry in the region.

Activities have included lunch forums on key industry topics, breakfast meetings to introduce industry managers to university researchers, consulting skills workshops for university staff, a northern area awareness campaign, and an employment strategy study.

Recently there has been an effort to redraft and redirect the strategy plan of the Precinct. A key objective has been to demonstrate that the Precinct is a partnership between the various organisations.

(iv) Credit Transfer [9]

The Committee to Facilitate Credit Transfer in the Northern Region was established in 1988. It grew out of a history of cooperation between the TAFE and higher education sectors in the region and a desire to foster further cooperation, particularly given changing industry career structures and new industry awards. Members include the regional offices of the Department of Schools Education, Batman Automotive College, Broadmeadows College of TAFE, Melbourne College of Textiles, Northern Metropolitan College of TAFE, La Trobe University and Royal Melbourne Institute of Technology. The major activities of the Committee have been:

- development of effective, formal credit transfer arrangements between the institutions;
- dissemination of information to students regarding credit transfer opportunities in the region;
- promotion generally of the concept of credit transfer and pathways for students in the region.

The work is carried out by working parties which are established and disbanded as needed. Working Parties have been convened for a range of study fields: computing, social and community services, engineering, accounting, agriculture and science.

A statement from the 1991 Report [9] of the Committee is informative:

"Although the formation of the Committee predated many of the government initiatives aimed at developing greater coordination between general and vocational education at all levels, the work of the Committee complements these national developments and policy directions and seeks ways of translating them into practical action. When the Committee was established in 1988, it agreed that its approach to credit transfer would be practical and focus on readily achievable outcomes. This approach was selected as opposed to alternatives that would have documented existing credit transfer agreements rather than

promoting their development or identified issues affecting credit transfer in the northern region rather than promoting cooperation and forging relationships which would overcome resistance to credit agreements based on outdated attitudes or artificial structural barriers."

The Report attributes the success of the Committee largely to its focus on practiced outcomes and the personal contact which take place through committee meetings and the working parties. These qualities have allowed educational providers to move "beyond documenting how much of one course is equal to another to exploring cooperation between institutions". The Science Working Party, for example, has developed a data base of equipment holdings which is available for access by other institutions in the region. This Working Party is also exploring the combination or sharing of teaching of courses which have a small number of courses.

A Committee for the North

Informal links have developed between the networks. In some cases this has been because of complementary, and sometimes overlapping, activities; a number of joint projects have been implemented. Of more consequence, is that often the same institutions are members of these networks. In many cases the same persons represent the institutions and indeed have been instrumental in the genesis and success of the networks. It is possible to identify a number of key individuals who have been 'champions' for the concept of forming links or partnerships to achieve objectives.

There is a unifying theme between the networks of economics and social development of the region. Recently there has been an effort to develop a "Committee for the North" to be an umbrella organisation to provide a formal strategic link between the networks, to play a coordinating role to avoid duplication of activity, to effectively advocate the region to government, and to undertake marketing and promotion of the region. The concept has received support from many of the key players and is advocated strongly by one of the municipal councils. Politicians have been supportive. However it has been slow and difficult to implement perhaps because of the large number of interested organisations and individuals involved and because of the difficulty of finding a clear focus. Inevitably some flexibility is lost each time there is a commitment to formal structure. Perhaps this is one step too far.

Other Alliances

The contacts and personal relationships developed through the networks have led to a range of cooperative activities. In the case of Royal Melbourne Institute of Technology for example, this includes joint teaching and laboratory and equipment sharing in manufacturing engineering and technology degrees with regional TAFE colleges, and a project to develop rational textiles education programs jointly with Melbourne College of Textiles.

Conclusions

It is recognised by industry that there are advantages to be gained through collaboration:

"The dynamics unloosed by a truly global economy, coupled with ongoing market volatility, provide the motivation and rational for increased

inter-firm collaboration. Successful regional economies have shown that it takes a subtle mix of technical sophistication, flexible production and market savvy, nurtured and facilitated by appropriate public-private partnerships, to be competitive in the international economy. We all must learn from these examples and adapt the general principles identified above to our specific regions and industries." 10

The argument can be generalised to the achievement of sound, economic and educational objectives in a region. Experience in the north of Melbourne indicates that it is possible for organisations to achieve far more working in partnership than they can working alone. In any case it is an imperative that our nation can not afford to duplicate resources: we will have to learn to share, to act cooperatively, to pool our resources and knowledge in order to achieve our common goals.

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JOURNAL OF INSTITUTIONAL RESEARCH - AUSTRALASIA

GUIDELINES FOR SUBMISSIONS

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Formal and informal submissions, as detailed below, are invited from members, private and public organisations, institutions, and corporate bodies, and private individuals. JIRA, through the Editorial Board, reserves the right to accept or reject any submission.

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The manuscript of articles should be supplied on floppy disk in IBM-DOS or Apple Mac format, plus two paper copies, double space typed in single-side A4 page format. All pages should have an all round margin of not less than 2 cm and should be numbered consecutively. All tables and figures should likewise be supplied in duplicate. Captions for all tables and figures should be provided on a separate sheet and the text should indicate where the author requires such items to be located. Sources, other than the author's original work, must be acknowledged where relevant for all diagrammatic material. Credits for photography and artwork are not required where subject to prior copyright.

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Tables should be numbered consecutively in their order of appearance in the text and must be captioned. Measures or units should be abbreviated and the decimal system used in preference to fractional presentation except where conventional usage calls for the latter.

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References:

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Reports, theses, etc. Style title like an article, with as much source information as possible. In other style matters, please consult the AGPS Style Manual.

GENERAL

All members submitted for publication should be legibly presented, preferably in typed form. Line advertisements should be submitted in typed double spaced format. All other advertisements should be submitted in camera-ready artwork form corresponding to required column width.

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If requested, pages proofs of accepted submissions will be sent to authors for checking. These must be returned to the Editor within one week. Authors should keep duplicates of all submissions and artwork. Photographs and disks will be returned on request. The abbreviation for the Journal of Institutional Research - Australasia is JIRA.

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Senior Lecturer
School of Social Science
La Trobe University College of Northern Victoria
C/- 12 Steane Street Bendigo Victoria 3550 AUSTRALIA
Phone 054 447 230; Fax 054 433 344

Ms. Wendy Marchment
Planning Manager
The Flinders University of South Australia
GPO Box 2100 Adelaide 5001 SOUTH AUSTRALIA
Phone 08 201 3677; Fax 08 201 3027

Dr. Jenny Haystead
Director for Planning, Information and Communications
Auckland Institute of Technology
Private Bag 92006 Auckland 1020 NEW ZEALAND
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